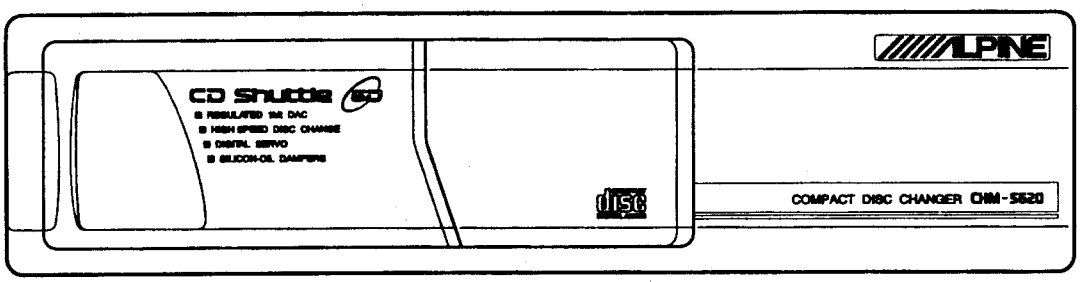
ALPINE®

SERVICE MANUAL

Compact Disc Remote Changer

CD Shuttle

COMPACT disc DIGITAL AUDIO



CHM-S620

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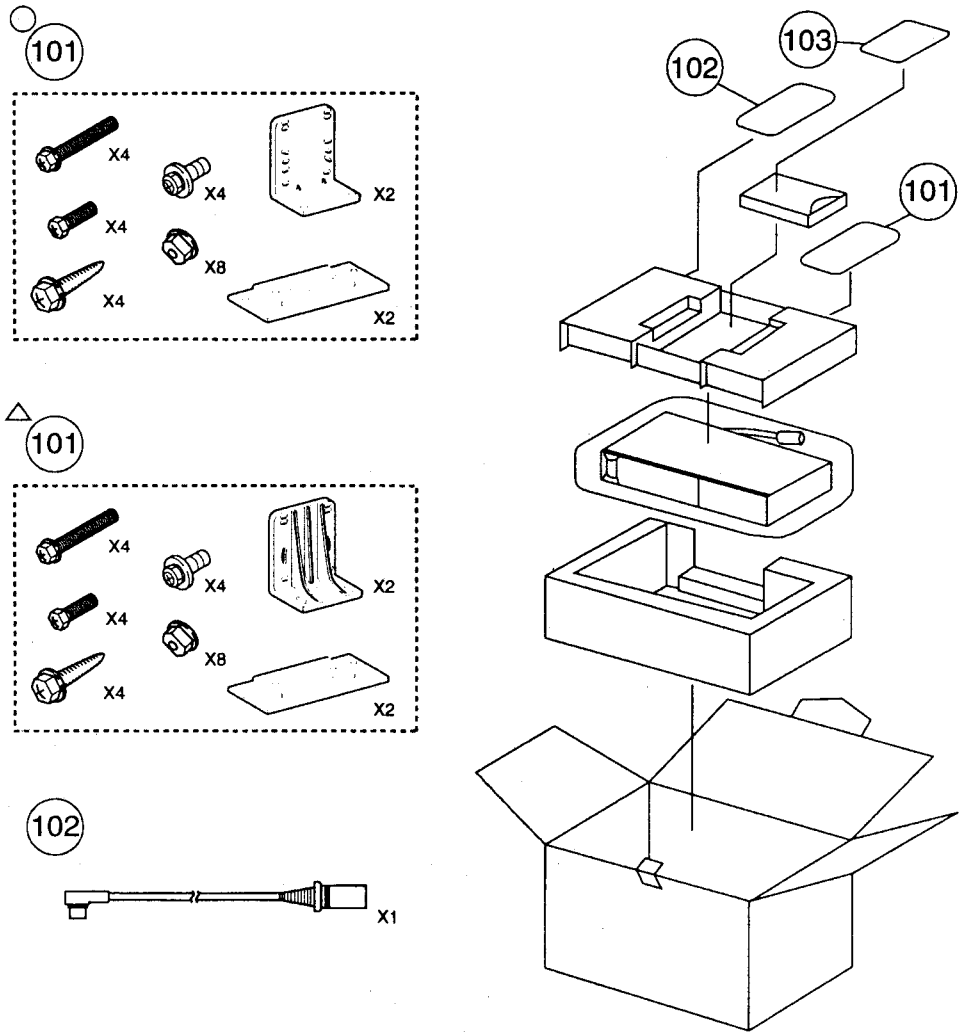
Packing Assembly Parts List

Symbol No.	Part No.	Description
○ 101	01C71646W02	Assy., Kit Installation
△ 101	01C71646W01	Assy., Kit Installation
102	01T45150W03	Assy., DIN Cable
103-1	68P11646Y59	Owner's Manual
△ 103-2	68P21523Y03	Owner's Manual (I/G/S)
103-3	15A20849Y01	Cover, Plate L/R

Symbol No.	Part No.	Description

NOTE : ○: For North American Model Only, △: For General Foreign Model Only, Others : Common.

Packing Method View



NOTE : ○ : For North American Model Only, △ : For General Foreign Model Only, Others : Common.

Specifications

<CD SECTION>

System	Optical (Compact Disc System)
Quantizing Bit Number	16 Bit Linear System
Channels	2 Channels, Stereo
Distortion (997Hz)	0.02%
Frequency Response (Ref. 1kHz)	±2dB (17Hz~19.997kHz)
S/N Ratio	90dB
Channel Separation	75dB (997Hz)
	65dB (10.007kHz)
De-Emphasis (Ref. 1kHz)	-20±3dB (4kHz)
	-20±3dB (16kHz)
Currents Consumption (at PLAY)	1A

<GENERAL>

Power Supply	14V DC (10.5~16V allowable)
Output Voltage/Impedance	850±150mV/10kohm
Dimensions (W×H×D)	255×63×161.5mm
Weight	1.7kg

<COMPACT DISC>

Track Pitch	1.6μm
Modulator Frequency	44.1kHz
Transfer Rate	4.3218 Mbit/sec.
Dimensions	120×1.2mm

Note : Due to Continuing product improvement, specifications and designs are subject to change without notice.

Servo Monitor (Part No. 01E20845S01)

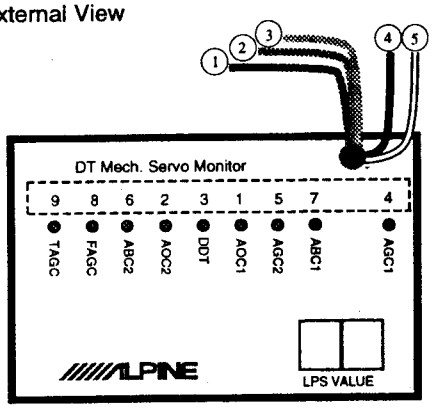
I. Purpose

CHM-S620 performs digital signal processing in the inside of Super 1 chip LSI and the outside alignment circuit builds in to this LSI and each alignments are automatic.

This DT Mechanism Servo Monitor is a jig for the automatic alignment circuitry. Please refer to the following list for the reference;

1. LED indicates the alignment.
2. Diagnosis of automatic alignment.
3. LED indicates a failure item for easy failure analysis of servo circuitry.

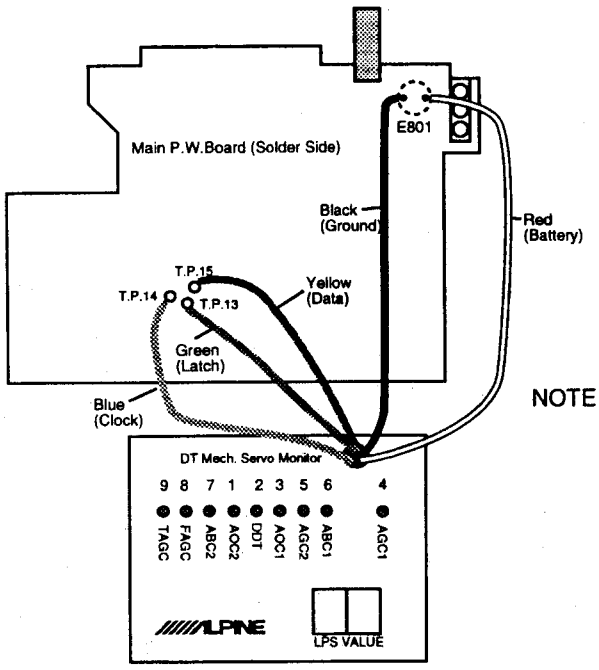
External View



	①	②	③	④	⑤
Wire Color	Yellow	Green	Blue	Black	Red
Name	Data	Latch	Clock	Ground	Battery

* The numbers of the automatic alignment sequence.

II. Connection Points and Connection Method



NOTE : For the Test Points (T.P.13~15), refer to the Parts Layout on P.W.Boards and Wiring Diagram.

Connect each of the wires to the Test point as illustrated in the diagram.

* Be very careful not to shorts the test points since they are located close together.

III. Operating Specifications

The automatic adjustment operations of the CHM-S620 are performed by output of the commands of the various adjustment items from the main microprocessor. Adjustments are performed in response to these commands by the super 1-chip LSI. This servo monitor jig receives the signal returned to the main microprocessor from the super 1 chip LSI and causes the LED to light or go off. The adjustment condition (of either completed or not yet completed) of the various adjustment items can be checked using the lighting condition of this LED. The following test discs are required for the good/fault judgment:

1. A-BEX TCD-721 (6th track - 1.2mm) : Scratch test disc
2. A-BEX TCD-782 : Signal test disc

Measures to be Taken Corresponding to the LED Indication

1. When a LED other than FAGC or TAGC lights, perform the fault causation analysis using the fault diagnosis chart according to the LED indication.
2. When only the FAGC or TAGC LED turn on a lights (indicating that the focus/tracking fine gain adjustment is not completed), perform the focus/tracking servo gain adjustment. If the value is within the specification, the adjustment is normal.

i) LED indications

Lit : Fault Unlit : OK

Adjustment Order	LED Name	Adjustment Order	Contents
1	AOC1	Focus offset adjustment	Corrects the focus error value as an offset.
2	AOC2	Tracking offset adjustment	Corrects the tracking error value as an offset.
3	DDT	Disc detection	Detects the presence or absence of a disc.
4	AGC1	Focus rough gain adjustment	Determines the amount of external interference applied at the time of the focus rough gain adjustment.
5	AGC2	Tracking rough gain adjustment	Determines the amount of external interference applied at the time of the racking rough gain adjustment.
6	ABC2	Tracking balance adjustment	Corrects the average value of the tracking error as a balance value.
7	ABC1	Focus balance adjustment	Provides correction so that the focus error signal can take balance between positive sections and negative sections.
8	FAGC	Focus fine gain adjustment	Introduces external interference and adjusts the focus gain to an appropriate value.
9	TAGC	Tracking fine gain adjustment	Introduces external interference and adjusts the tracking gain to an appropriate value.

ii) Seven-Segment LED (LPS Value)

This mechanism has 13 position of 1T to 6T, 1P to 6P, E.
Those positions indicate height of elevator of mechanism in 7 segment LED in hexadecimal.
IC501 reads data from these positions and convert into A/D signal. Hexadecimal and tray location refer to the following list.

* The 1st to 6th disc traies step each 1T to 6T draw out of magazine.
The 1st to 6th discs step each 1P to 6P to disc chuck and play.
E is the position that magazine ejects.

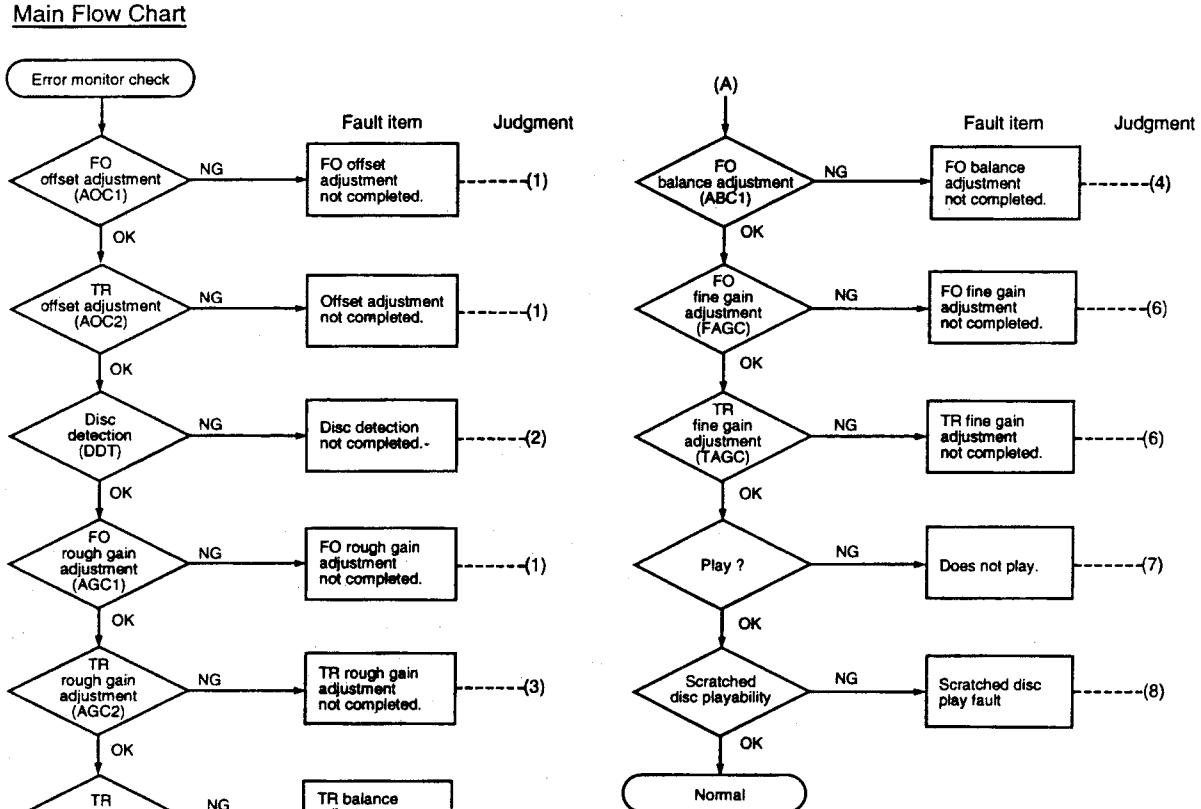
Position			Ratio of Resistance Value (%)	Hex Code
6P			91.00	F2-F6
5P			78.76	D3-D7
	6T		76.17	C1-C5
4P			66.52	63-67
	5T		63.94	A2-A6
3P			54.29	93-97
	4T		51.70	82-86
2P			42.05	74-78
	3T		39.46	63-67
1P			29.81	55-59
	2T		27.22	44-48
	1T		15.95	27-31
		E	5.00	0B-0F

NOTE 1 : Display of each position is value of limit of HEX code, liner position sensor is normal.

NOTE 2 : In case of LPS is normal and disc change actuating is not smooth, check magazine circumference tray chassis again.

IV. Fault Diagnosis Chart

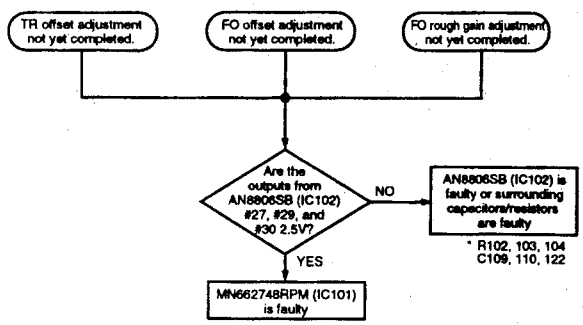
Main Flow Chart



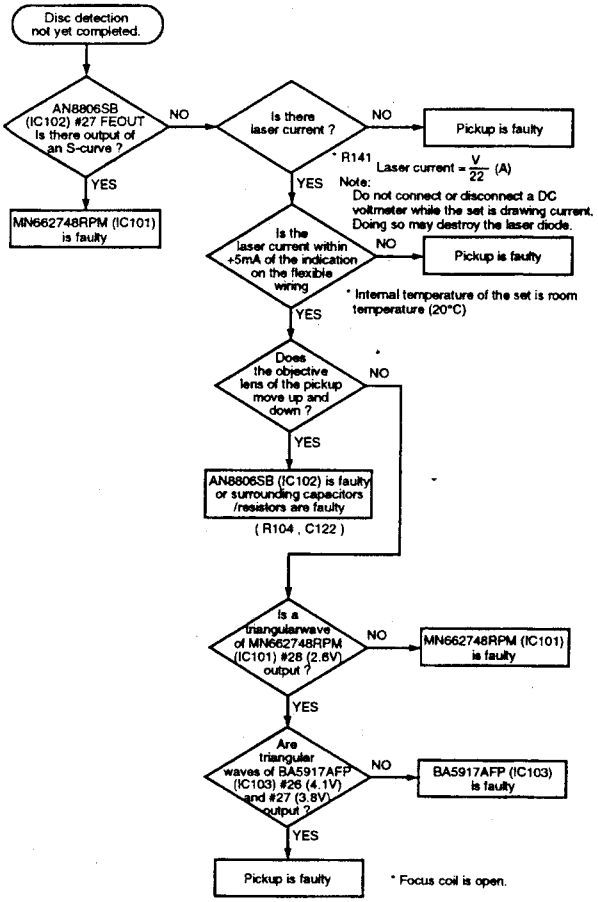
* Notes

1) When more than one LED are light, perform a circuit check according to the order of the main flow chart.
2) Proper soldering of patterns and IC pins is a precondition. Accordingly, when an IC fault is reached in the flow chart, do not replace the part immediately; check the soldering (for loose and bridges).
3) Faults such as faulty capacitors and resistors in the flow include bad parts, different constants, looseness, and cracks.
4) Use track 6 of A-BEX TCD-721 for the scratched disc playability check.

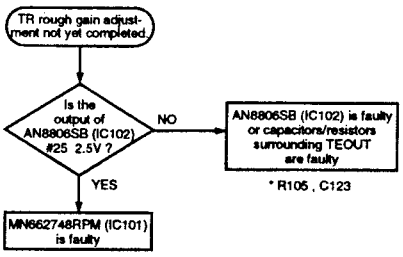
Judgments (1)


TR offset adjustment not yet completed.
FO offset adjustment not yet completed.
FO rough gain adjustment not yet completed.
Are the outputs from AN8806SB (IC102) #27, #29, and #30 2.5V?
NO
AN8806SB (IC102) is faulty or surrounding capacitors/resistors are faulty
* R102, 103, 104 C109, 110, 122
YES
MN662748RPM (IC101) is faulty

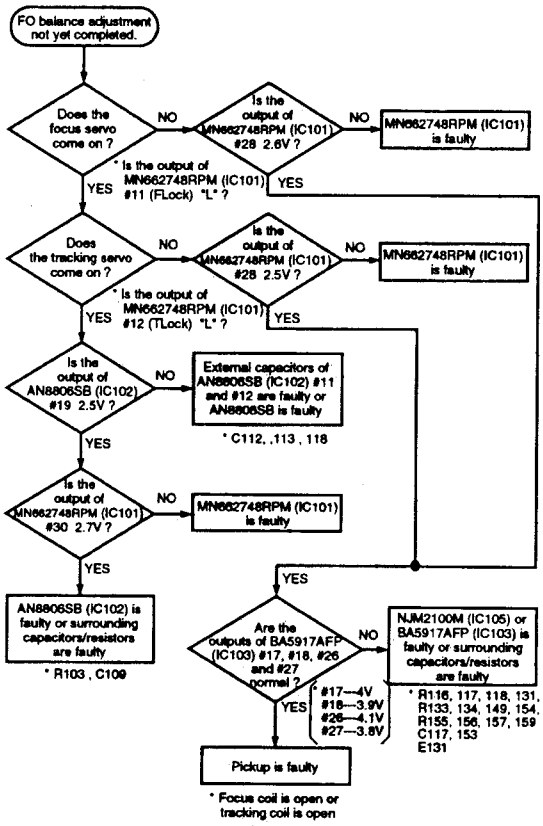
Judgments (2)


Disc detection not yet completed.
AN8806SB (IC102) #27 FEOUT Is there output of an S-curve ?
NO
YES
MN662748RPM (IC101) is faulty
Is there laser current ?
NO
Pickup is faulty
* R141
Laser current = V/22 (A)
YES
Note:
Do not connect or disconnect a DC voltmeter while the set is drawing current. Doing so may destroy the laser diode.
Is the laser current within +5mA of the indication on the flexible wiring
NO
Pickup is faulty
* Internal temperature of the set is room temperature (20°C)
YES
Does the objective lens of the pickup move up and down ?
NO
YES
AN8806SB (IC102) is faulty or surrounding capacitors /resistors are faulty
(R104 , C122)
Is a triangularwave of MN662748RPM (IC101) #28 (2.6V) output ?
NO
MN662748RPM (IC101) is faulty
YES
Are triangular waves of BA5917AFP (IC103) #26 (4.1V) and #27 (3.8V) output ?
NO
BA5917AFP (IC103) is faulty
YES
Pickup is faulty
* Focus coil is open.

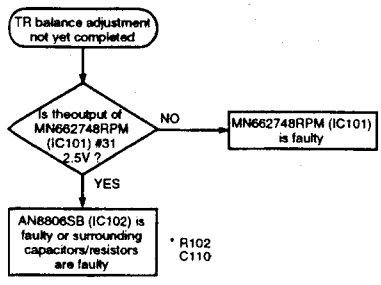
Judgments (3)


TR rough gain adjustment not yet completed.
Is the output of AN8806SB (IC102) #25 2.5V ?
NO
AN8806SB (IC102) is faulty or capacitors/resistors surrounding TEOUT are faulty
* R105 , C123
YES
MN662748RPM (IC101) is faulty

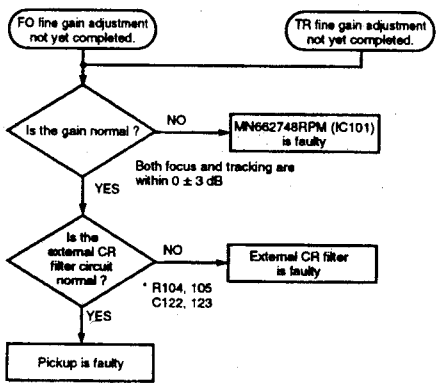
Judgments (4)


FO balance adjustment not yet completed.
Does the focus servo come on ?
NO
Is the output of MN662748RPM (IC101) #28 2.6V ?
NO
MN662748RPM (IC101) is faulty
YES
* Is the output of MN662748RPM (IC101) #11 (FLock) "L" ?
YES
Does the tracking servo come on ?
NO
Is the output of MN662748RPM (IC101) #28 2.5V ?
NO
MN662748RPM (IC101) is faulty
YES
* Is the output of MN662748RPM (IC101) #12 (TLock) "L" ?
YES
Is the output of AN8806SB (IC102) #19 2.5V ?
NO
External capacitors of AN8806SB (IC102) #11 and #12 are faulty or AN8806SB is faulty
* C112, ,113 , 118
YES
Is the output of MN662748RPM (IC101) #30 2.7V ?
NO
MN662748RPM (IC101) is faulty
YES
AN8806SB (IC102) is faulty or surrounding capacitors/resistors are faulty
* R103 , C109
YES
Are the outputs of BA5917AFP (IC103) #17, #18, #26 and #27 normal ?
NO
NJM2100M (IC105) or BA5917AFP (IC103) is faulty or surrounding capacitors/resistors are faulty
* R116, 117, 118, 131, R133, 134, 149, 154, R155, 156, 157, 159 C117, 153 E131
* #17—4V #18—3.9V #26—4.1V #27—3.8V
YES
Pickup is faulty
* Focus coil is open or tracking coil is open

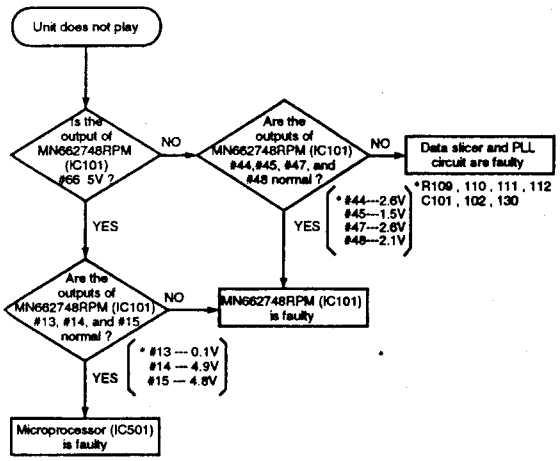
Judgments (5)


TR balance adjustment not yet completed
Is theoutput of MN662748RPM (IC101) #31 2.5V ?
NO
MN662748RPM (IC101) is faulty
YES
AN8806SB (IC102) is faulty or surrounding capacitors/resistors are faulty
* R102 C110

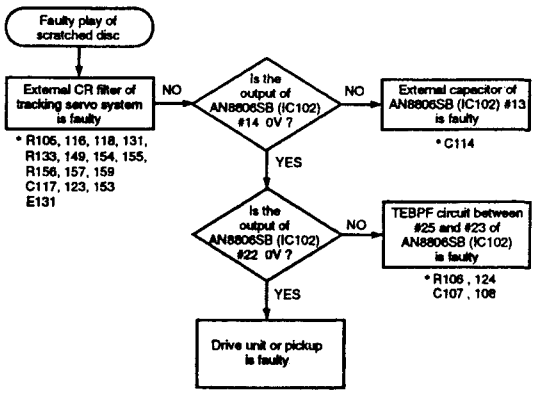
Judgments (6)


FO fine gain adjustment not yet completed.
TR fine gain adjustment not yet completed.
Is the gain normal ?
NO
MN662748RPM (IC101) is faulty
Both focus and tracking are within 0 ± 3 dB
YES
Is the external CR filter circuit normal ?
NO
External CR filter is faulty
* R104, 105 C122, 123
YES
Pickup is faulty

Judgments (7)



Judgments (8)


Faulty play of scratched disc
External CR filter of tracking servo system is faulty
NO
Is the output of AN8806SB (IC102) #14 0V ?
NO
External capacitor of AN8806SB (IC102) #13 is faulty
* C114
* R105, 116, 118, 131, R133, 149, 154, 155, R156, 157, 159 C117, 123, 153 E131
YES
Is the output of AN8806SB (IC102) #22 0V ?
NO
TEBPF circuit between #25 and #23 of AN8806SB (IC102) is faulty
* R106 , 124 C107 , 108
YES
Drive unit or pickup is faulty

Measurements

A. RF Signal Level Measurement

The main beam of the returning light is received by the photodiode and the output voltage is obtained by current-voltage conversion of A+B+C+D.

1. Block Diagram

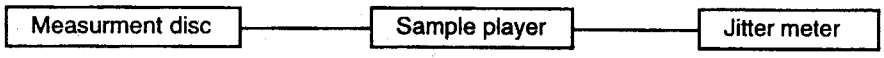
2. Measurement Method

(a). Connect the ground terminal of the oscilloscope VREF (AN8806SB (IC102), PIN 20) and measure the RF signal (of AN8806SB (IC102), pin 7).
(b). Play the first track of the measurement disc A-BEX TCD-782.
(c). Read the peak-to-peak value of the waveform.
Specification: 0.5V ±0.2
* When the value is outside of the specification (i.e., not good), check AN8806SB (IC102), the pickup, and R101.

B. Jitter Measurement

The standard deviation of the pulse width when a trigger is applied to the rising edge of the 3T component of the RF signal.

1. Block Diagram



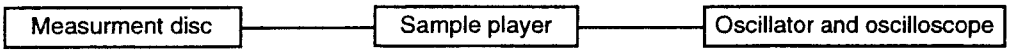
2. Measurement Method

(a). Connect the ground terminal of the jitter meter to VREF (AN8806SB (IC102), PIN 20) and measure the ARF signal (of AN8806SB (IC102), pin 10).
(b). Play the first track of the A-BEX TCD-782 measurement disc.
(c). Read the indicated value of the jitter meter.
Specification: 25nS or less
* When the value is outside of the specification, check AN8806SB (IC102), the pickup, and R101.

C. Focus Servo Gain Measurement

Measure the focus servo oper. loop gain in the servo-on (closed loop) condition.

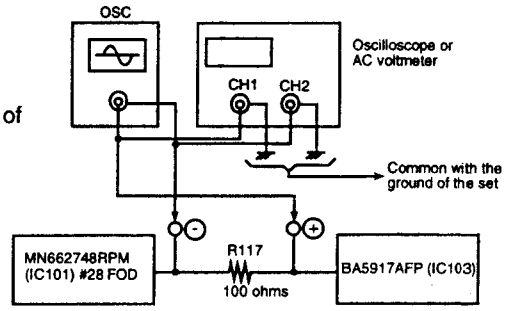
1. Block Diagram



2. Measurement Method using an Oscillator and an Oscilloscope

(a). Connect OSC output to resistor for gain measurement (100 ohms). (Connect a servo driver side to positive side.)
(b). Connect CH1 of oscilloscope to a servo driver side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(c). Connect CH2 of oscilloscope to MN662748RPM (IC101) side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(d). Play back the eighth track of A-BEX TCD-782 disc for measurement. (No sound recording track)
(e). Output frequency (1.2 kHz, 50 mVP-P) from OSC and compare the amplitude of CH1 and CH2 of oscilloscope and convert into dB.
NOTE: AC voltmeter is available to measurement.

3. Connection (Example)



* FOD: Focus drive output

D. Tracking Servo Gain Measurement

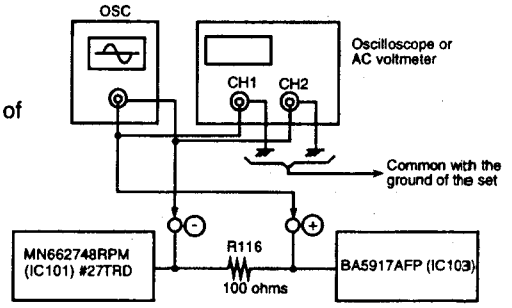
Measure the tracking servo open loop gain in the servo-on (closed loop) condition.

1. Block Diagram

2. Measurement Method using an Oscilloscope

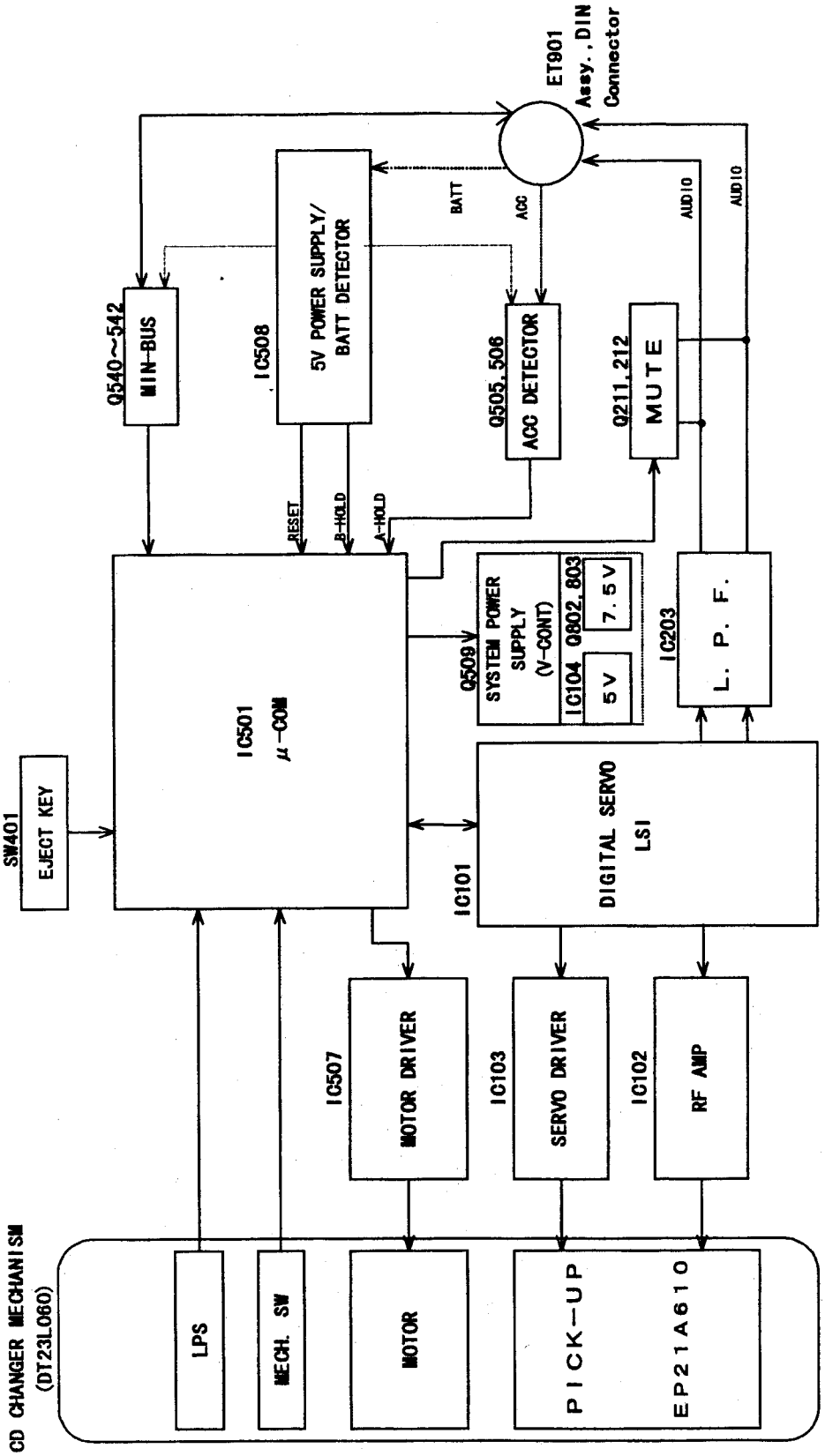
(a). Connect OSC output to resistor for gain measurement (100 ohms). (Connect a servo driver side to positive side.)
(b). Connect CH1 of oscilloscope to a servo driver side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(c). Connect CH2 of oscilloscope to MN662748RPM (IC101) side of resistor for gain measurement (100 ohms). (Connect negative side with GND of set.)
(d). Play back the eighth track of A-BEX TCD-782 disc for measurement. (No sound recording track)
(e). Output frequency (1.2 kHz, 50 mVP-P) from OSC and compare the amplitude of CH1 and CH2 of oscilloscope and convert into dB.
NOTE: AC voltmeter is available to measurement.

3. Connection (Example)



* TRD: Tracking drive output

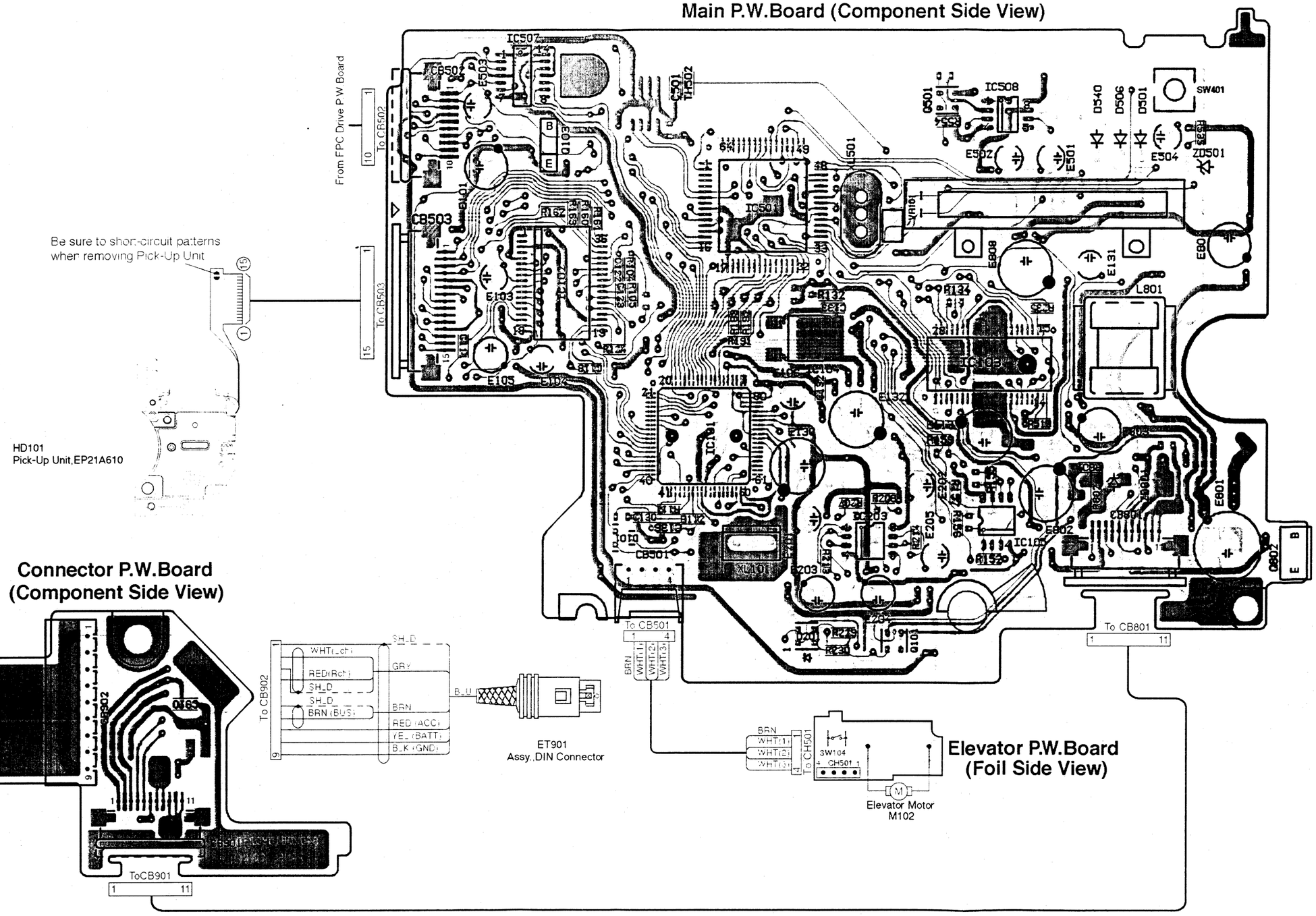
Block Diagram



MEMO

Parts Layout on P.W. Boards and Wiring Diagram (1/2)

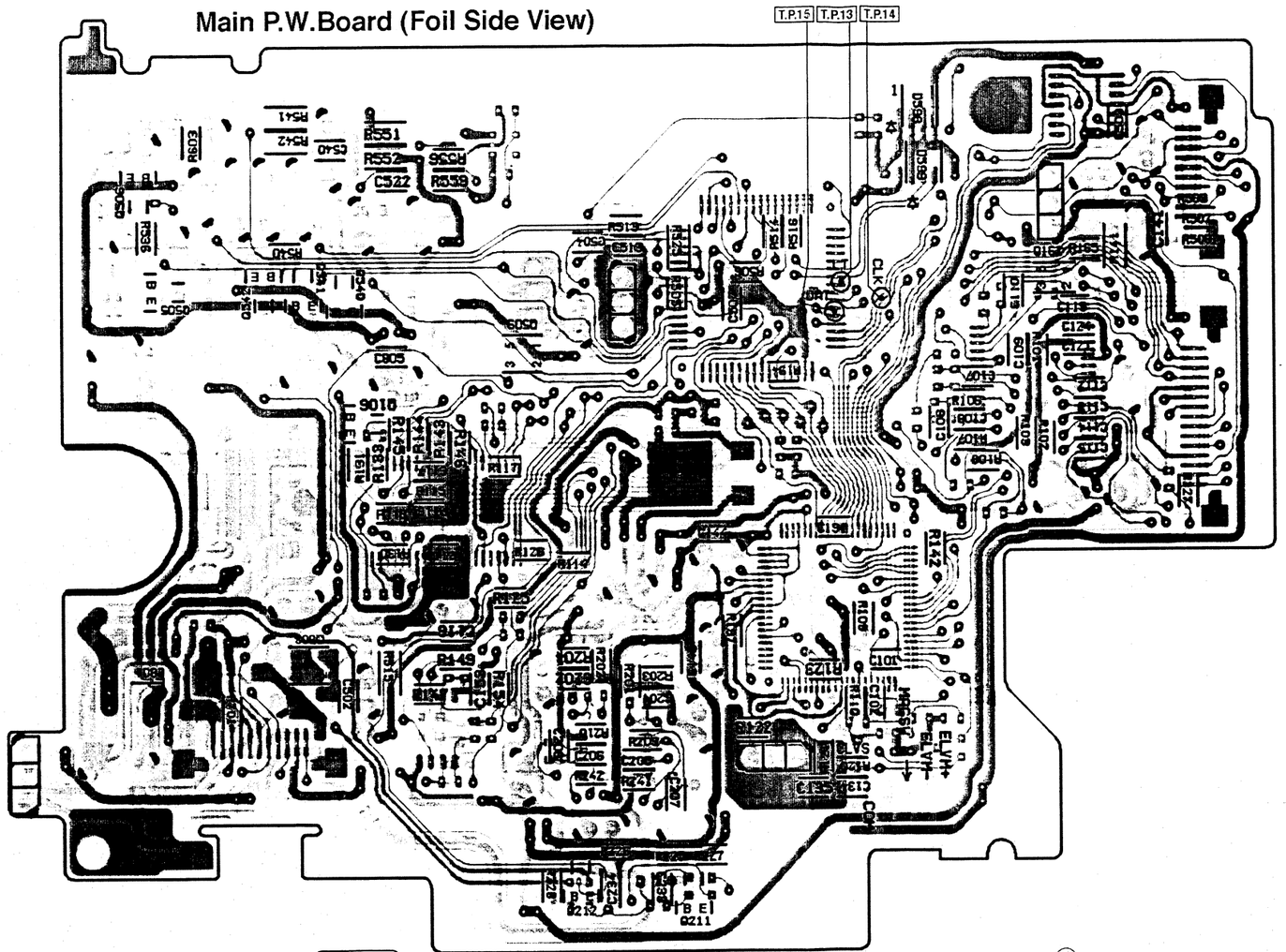
Main P.W.Board (Component Side View)



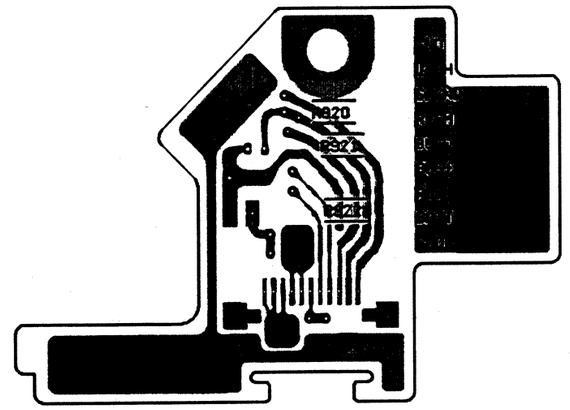
Gray Color Pattern : Component Side Pattern
Blue Color Pattern : Foil Side Pattern

Parts Layout on P.W. Boards and Wiring Diagram (2/2)

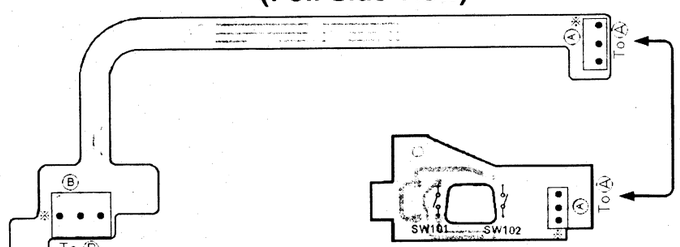
Main P.W.Board (Foil Side View)



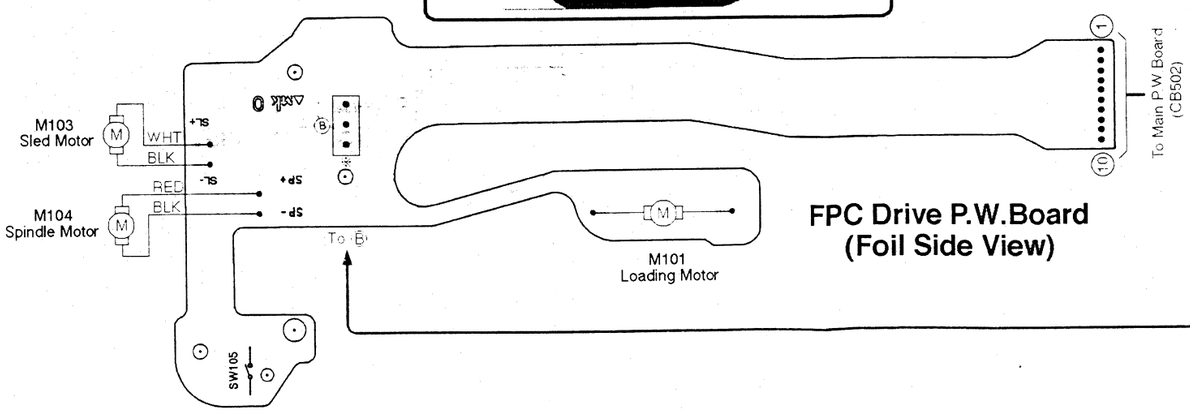
Connector P.W.Board
(Foil Side View)



FPC Switch P.W.Board
(Foil Side View)

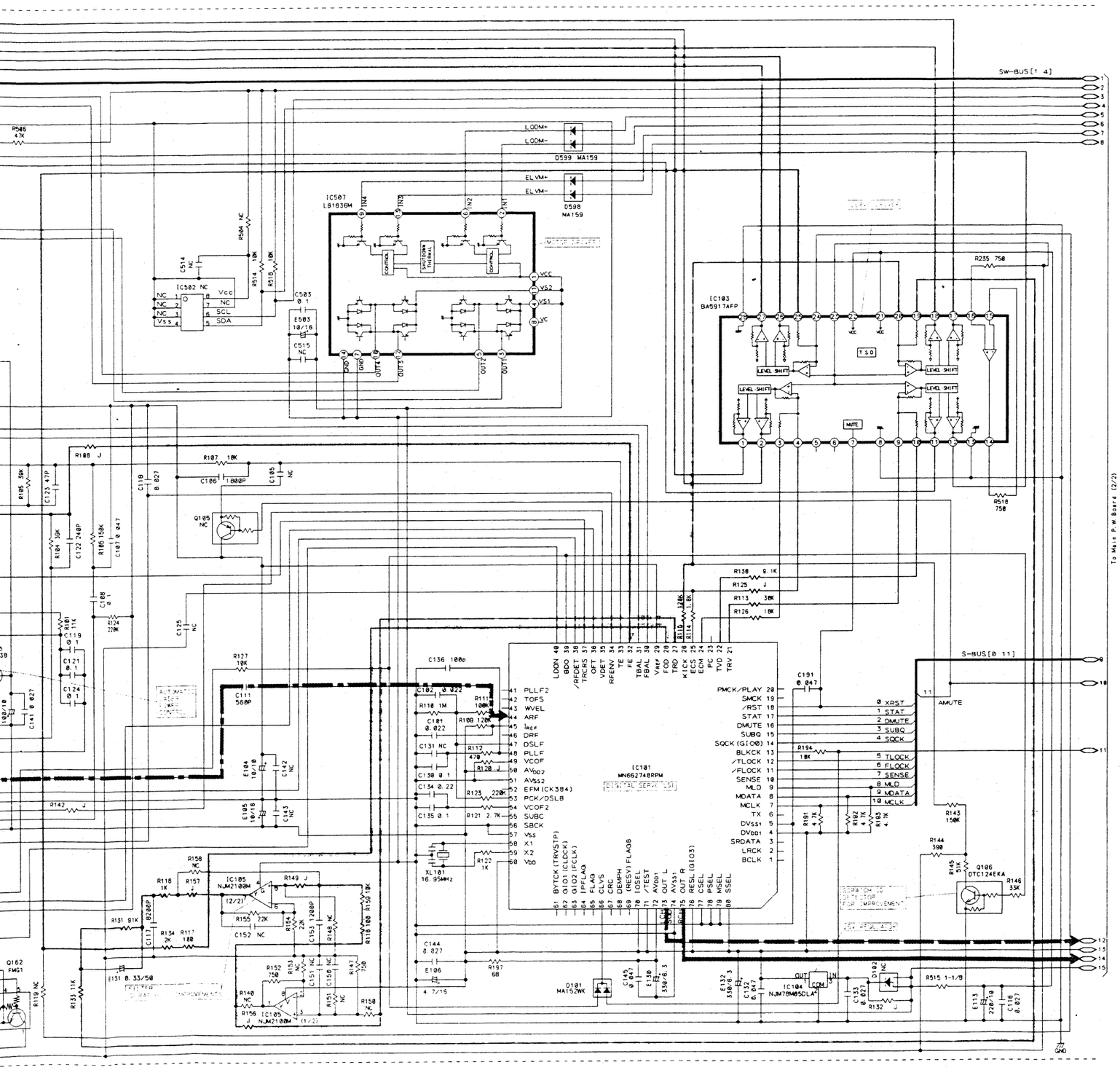


Switch P.W.Board
(Foil Side View)



FPC Drive P.W.Board
(Foil Side View)

Gray Color Pattern : Component Side Pattern
Blue Color Pattern : Foil Side Pattern



Rch Signal Line
Lch Signal Line
CD Signal Line
Focus Error Signal Line
Tracking Error Signal Line
Spindle Servo Signal Line
Sled Servo Signal Line

IC101

1	NC	21	2.6V	41	NC	61	NC
2	NC	22	2.6V	42	NC	62	NC
3	NC	23	NC	43	NC	63	NC
4	5.1V	24	2.6V	44	2.6V	64	NC
5	0V	25	2.5V	45	1.3V	65	NC
6	NC	26	2.6V	46	NC	66	5.1V
7	5V	27	2.5V	47	2.6V	67	5.1V
8	5V	28	2.7V	48	1.7V	68	NC
9	5.1V	29	2.6V	49	0V	69	5.1V
10	0V	30	2.3V	50	5.1V	70	5.1V
11	0V	31	2.6V	51	0V	71	5.1V
12	0V	32	2.6V	52	NC	72	4.9V
13	0.1V	33	2.6V	53	2.8V	73	2.4V
14	4.9V	34	2.6V	54	2V	74	0V
15	3V	35	0V	55	NC	75	2.4V
16	0V	36	0V	56	0V	76	5.1V
17	5V	37	0.9V	57	0V	77	0V
18	5V	38	0V	58	2.6V	78	0V
19	NC	39	0V	59	2.6V	79	0V
20	NC	40	5V	60	5.1V	80	5.1V

IC102

1	NC	19	2.5V
2	NC	20	2.5V
3	0V	21	5.1V
4	NC	22	0V
5	5.1V	23	2.5V
6	2.6V	24	0.9V
7	2.9V	25	2.5V
8	2.6V	26	2.6V
9	3.8V	27	2.6V
10	1.6V	28	2.6V
11	4V	29	2.6V
12	3.3V	30	2.6V
13	3.8V	31	2.6V
14	0V	32	2.6V
15	3.7V	33	2.6V
16	0V	34	2.6V
17	0V	35	2.6V
18	0V	36	2.6V

IC103

1	4.4V	15	2.6V
2	3.6V	16	2.6V
3	2.6V	17	3.9V
4	2.6V	18	4V
5	0V	19	2.6V
6	1.7V	20	2.6V
7	5V	21	7.9V
8	0V	22	7.9V
9	2.6V	23	2.6V
10	2.6V	24	2.6V
11	4V	25	2.7V
12	4V	26	4.2V
13	0V	27	3.8V
14	2.5V	28	0V

IC104

1	5.1V
2	0V
3	7.9V

IC105

1	2.6V
2	2.6V
3	2.6V
4	0V
5	2.5V
6	2.6V
7	2.5V
8	5.1V

IC507

1	7.9V	8	1.9V
2	4.9V	9	4.5V
3	0V	10	0V
4	8V	11	8V
5	0V	12	0V
6	4.5V	13	4.5V
7	0V	14	0V

	E	C	B
Q103	4.4V	2.5V	3.8V
Q106	0V	2.6V	0V

	1	2	3	4	5
Q162	2.6V	0V	5V	0V	0V

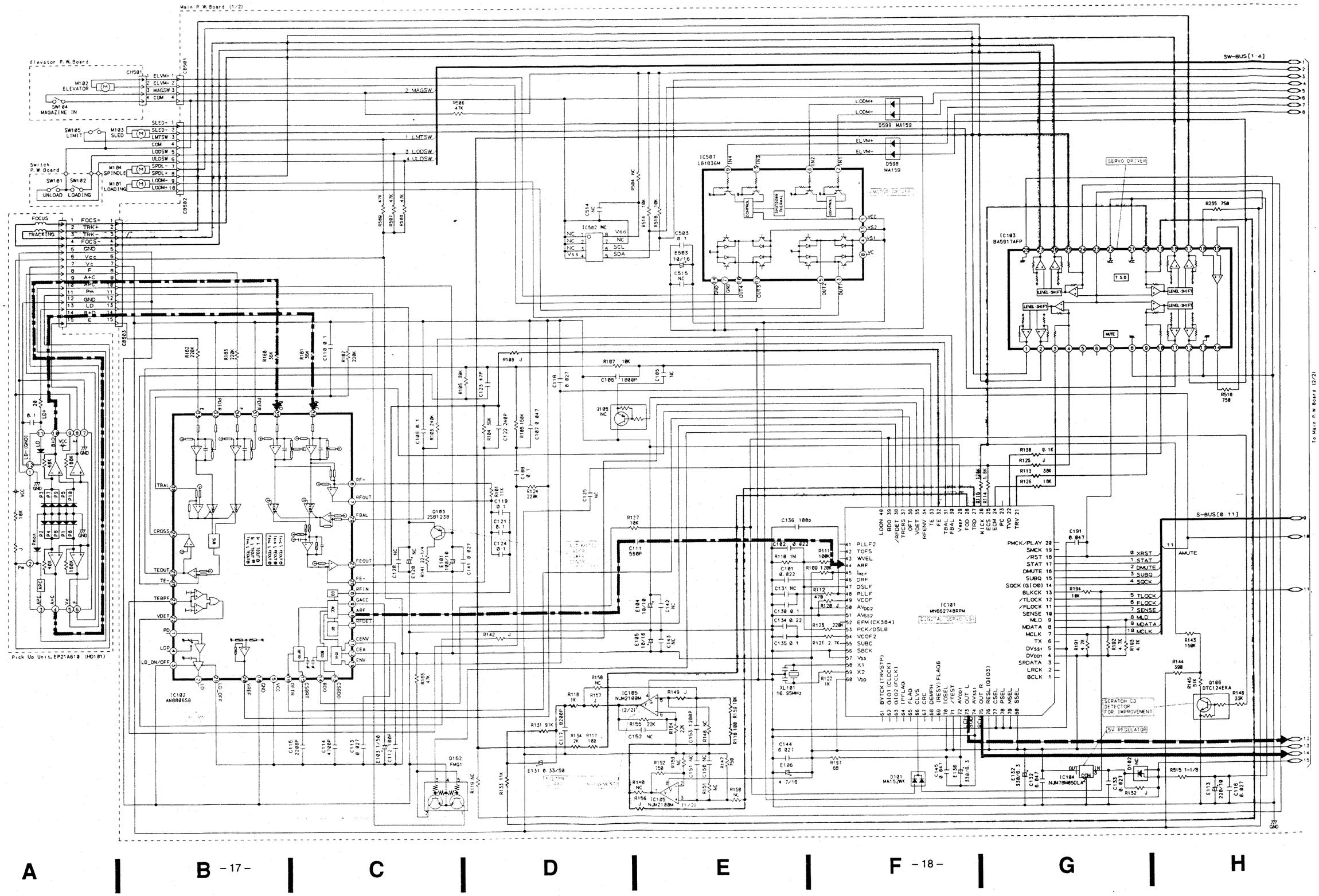
[Measuring Conditions]

- Power Supply Voltage : DC14V
- Measuring Meter : Digital Multi Voltmeter
- Measuring Point Reference : Between Ground
- Measuring Conditions : Playing Music Disc No. 1 at Room Temperature

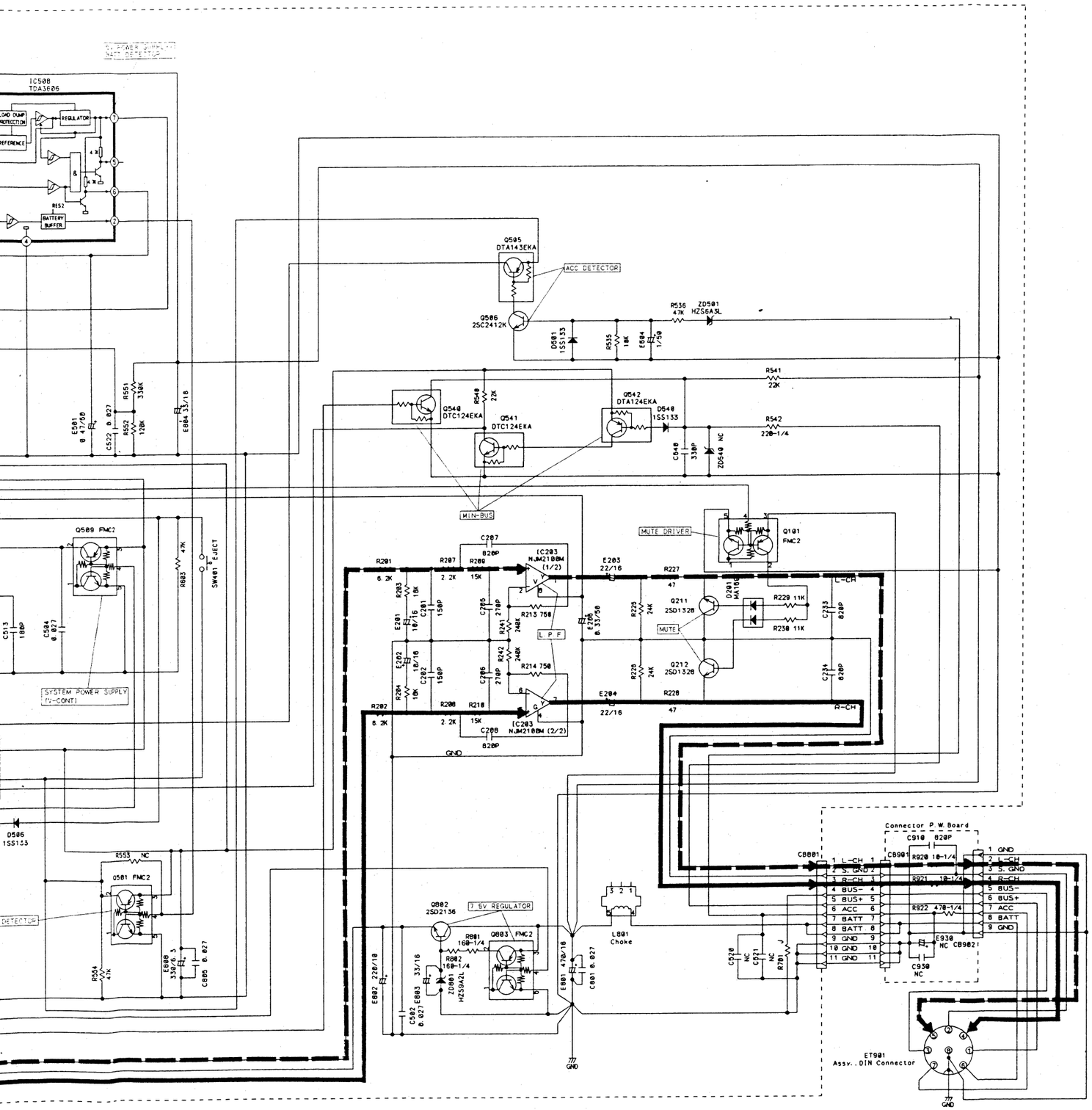
NOTE:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. $P = \frac{1}{1{,}000{,}000}$

Schematic Diagram (1/2)



To Main P.W.Board (2/2)



IC203

1	2.5V
2	2.5V
3	2.5V
4	0V
5	2.5V
6	2.5V
7	2.5V
8	5.1V

IC501

1	NC	17	NC	33	0V	49	0V
2	1.4V	18	0V	34	5V	50	5V
3	NC	19	NC	35	5V	51	0V
4	NC	20	NC	36	4.5V	52	5V
5	NC	21	NC	37	5V	53	5.1V
6	0.1V	22	4.8V	38	5V	54	0V
7	5V	23	0V	39	0.1V	55	5V
8	NC	24	0V	40	5V	56	5V
9	0V	25	0V	41	2.5V	57	2.6V
10	5V	26	0V	42	2.5V	58	NC
11	5V	27	NC	43	0V	59	4.9V
12	0V	28	5.1V	44	NC	60	NC
13	5V	29	5V	45	0V	61	NC
14	5V	30	5V	46	0V	62	NC
15	5V	31	5V	47	1.7V	63	NC
16	5V	32	0V	48	2.5V	64	NC

IC508

1	3.6V
2	4.9V
3	2.7V
4	0V
5	NC
6	5V
7	5V
8	13.8V

	E	C	B		E	C	B
Q211	0V	0V	-0.3V	Q540	0V	13.3V	1.3V
Q212	0V	0V	0V	Q541	0V	5V	1.3V
Q505	5V	5V	0V	Q542	5.1V	1.3V	5.5V
Q506	0V	0V	0.6V	Q802	8.6V	13.8V	8.1V

	1	2	3	4	5
Q101	NC	-0.3V	13.8V	0V	0V
Q501	NC	5V	5V	5V	0V
Q509	NC	5V	5.1V	5V	0V
Q803	NC	13.6V	13.7V	5V	0V

[Measuring Conditions]

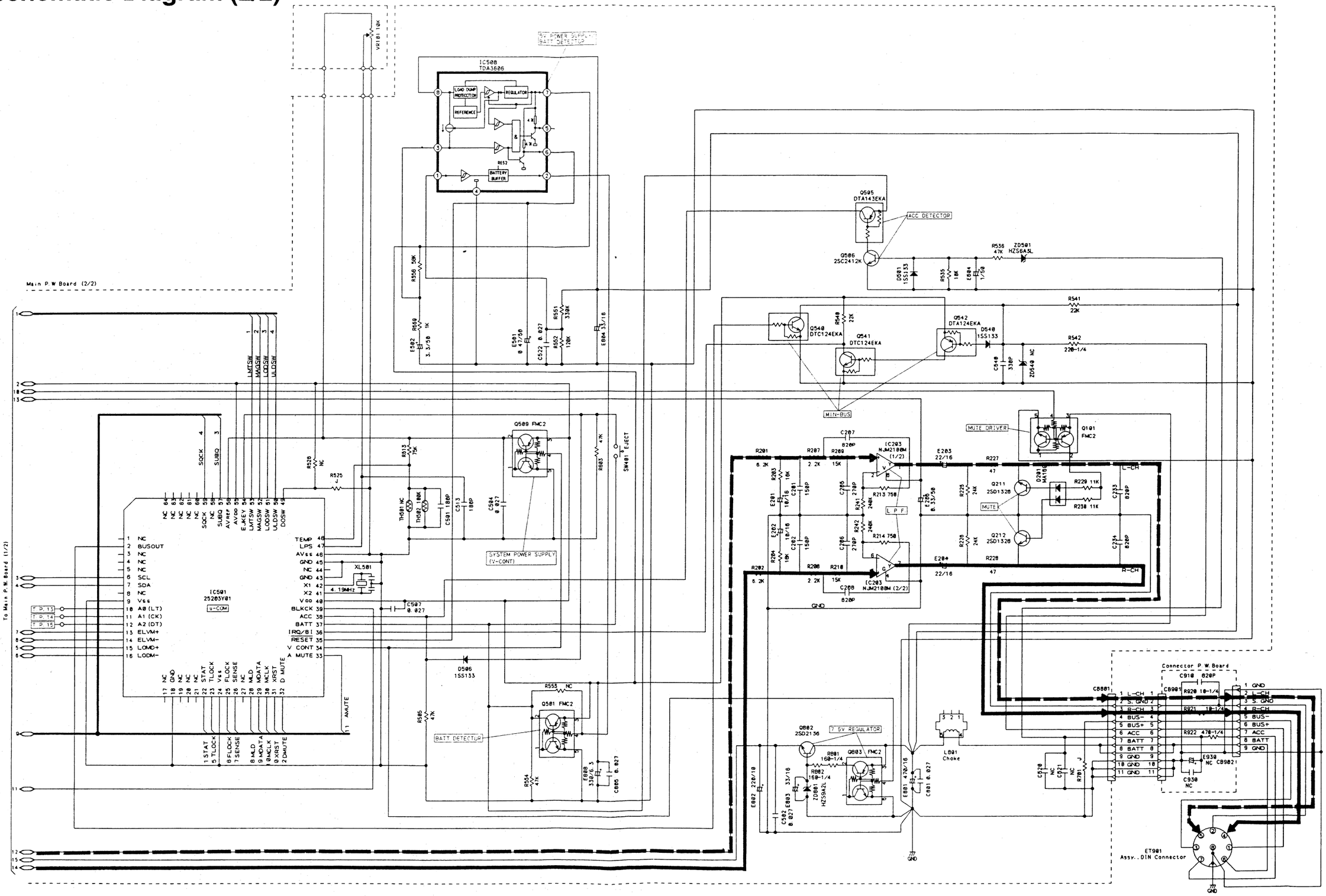
- Power Supply Voltage : DC14V
- Measuring Meter : Digital Multi Voltmeter
- Measuring Point Reference : Between Ground
- Measuring Conditions : Playing Music Disc No. 1 at Room Temperature

NOTE:

1. All resistance values are in ohms. K = 1,000
2. All capacitance values are in microfarads. $P = \frac{1}{1{,}000{,}000}$

CHM-S620 CHM-S620

Schematic Diagram (2/2)



Description of IC Terminal

25203Y01 : IC501

No.	Symbol	I/O	Terminal Description
1	NC	—	No connect terminal.
2	BUS OUT	O	BUS output.
3	NC	—	No connect terminal.
≀			
5			
6	SCL	—	Pull up terminal.
7	SDA		
8	NC	—	No connect terminal.
9	V_{SS}	—	GND connect terminal.
10	A0 (LT)	O	Auto adjustment output. (LATCH)
11	A1 (CK)	O	Auto adjustment output. (CLOCK)
12	A2 (DT)	O	Auto adjustment output. (LATCH)
13	ELVM +	O	Elevator motor (+) out put.
14	ELVM -	O	Elevator motor (-) out put.
15	LODM +	O	Loading motor (+) output.
16	LODM -	O	Loading motor (-) output.
17	NC	—	No connect terminal.
18	GND	I	GND connect terminal.
19	NC	—	No connect terminal.
≀			
21			
22	STAT	I	Start signal input.
23	TLOCK	I	Tracking servo pull in signal.
24	V_{SS}	—	GND connect terminal.
25	FLOCK	I	Focus servo pull in signal.
26	SENSE	I	Sense signal input.
27	NC	—	No connect terminal.
28	MLD	O	LSI Control latch output.
29	MDATA	O	LSI Control data output.
30	MCLK	O	LSI Control clock.
31	XRST	O	Surroundings reset.
32	D MUTE	O	Digital MUTE output.
33	A MUTE	O	Analog MUTE output.
34	V CONT	O	Power supply control.
35	$\overline{\text{RESET}}$	I	RESET Input. (L : Active)
36	IRQ/BI	I	BUS Input.
37	BATT	I	BATT Detect.
38	ACC	I	ACC Detect.
39	BLKCK	I	Sub code block clock.
40	V_{DD}	—	+5V

No.	Symbol	I/O	Terminal Description
41	X2	—	System clock 2. (4.19MHz)
42	X1	—	System clock 1. (4.19MHz)
43	GND	—	GND connect terminal.
44	NC	—	No connect terminal.
45	GND	—	GND connect terminal.
46	$A V_{SS}$	—	GND connect terminal.
47	LPS	I	Linear psition sensor.
48	TEMP	I	Temperature detect sensor.
49	DOSW	I	Light ON / OFF switch.
50	ULDSW	I	Unloading detect switch.
51	LODSW	I	Loading detect switch
52	MAGSW	I	Magazine detect switch.
53	LMTSW	I	Limit switch.
54	EJKEY	I	Elect KEY input.
55	$A V_{DD}$	—	+5V.
56	$A V_{REF}$	—	+5V.
57	SUBQ	I	SUBQ Input.
58	NC	—	No connect terminal.
59	SQCK	O	SQCK clock output.
60	NC	—	No connect terminal.
61 ~ 64	NC	—	No connect terminal.

Electrical Parts List

Capacitor : μF=microfarads,pF=picofarads

Abbreviations

RES.= Resistor	CAP.= Capacitor
C.F.= Carbon Film	ELY.= Electrolytic
M.F.= Metal Film	CER.= Ceramic
M.O.= Metal Oxide Film	MYL.= Mylar
M.P.= Metal Plate	TAN.= Tantalum
TR. = Transistor	POLY.= Polystyrol
TRANS.= Transformer	PP. = Polypropylene
CP. = Chip	PLT.= Polyethylene
	PF. = Polyester Film

Symbol No.	Part No.	Description
Main P.W.Board		
IC's		
IC101	51T15522Y01	MN662748RPM
IC102	51T65510W01	AN8806SB
IC103	51T15547Y02	BA5917AFP
IC104	51T95150W01	NJM78M05DLA
IC105	51T16025W01	NJM2100M
IC203	51T16025W01	NJM2100M
IC501	51T25203Y01	25203Y01
IC507	51T45571W02	LB1836M
IC508	51T85450W01	TDA3606
Transistors		
Q101	48T73888F12	CP., FMC2
Q103	48T84234F03	2SB1238
Q106	48T62967F03	CP., DTC124EKA
Q162	48T73888F08	CP., FMG1
Q211	48T63788F01	CP., 2SD1328
Q212	48T63788F01	CP., 2SD1328
Q501	48T73888F12	CP., FMC2
Q505	48T62966F01	CP., DTA143EKA
Q506	48T63417F01	CP., 2SC2412K
Q509	48T73888F12	CP., FMC2
Q540	48T62967F03	CP., DTC124EKA
Q541	48T62967F03	CP., DTC124EKA
Q542	48T62966F03	CP., DTA124EKA
Q802	48T65256W03	2SD2136
Q803	48T73888F12	CP., FMC2
Diodes		
D101	48T25651W02	CP., MA152WK
D201	48T81063F01	CP., MA159
D501	48T68828F11	1SS133
D506	48T68828F11	1SS133
D540	48T68828F11	1SS133
D598	48T81063F01	CP., MA159
D599	48T81063F01	CP., MA159
ZD501	48T25766W03	Zener, HZS6A3L
ZD801	48T25766W20	Zener, HZS9A2L
Crystals		
XL101	91T95076F12	16.95MHz
XL501	91T15285W01	CER., Lock 4.19MHz
Switch		
SW401	40T55182W03	Tact, SKHVBB (EJECT)
Thermistor / Coil		
TH502	48T15688Y01	CP., 100K ohm
L801	24T65097W01	Coil, Choke
Capacitors		
C101	08T15399W01	CP., 0.022μF
C102	08T15399W01	CP., 0.022μF
C106	08S65128F60	CP., 1800pF
C107	08T15399W03	CP., 0.047μF
C108	08S35374W01	CP., 0.1μF
C109	08S35374W01	CP., 0.1μF
C110	08S35374W01	CP., 0.1μF
C111	08S82122F55	CP., 560pF
C112	08S82122F37	CP., 100pF
C113	08T15399W04	CP., 0.027μF
C114	08S65128F65	CP., 4700pF
C115	08S65128F61	CP., 2200pF
C116	08T15399W04	CP., 0.027μF
C117	08S65128F68	CP., 8200pF
C118	08T15399W04	CP., 0.027μF
C119	08S35374W01	CP., 0.1μF
C121	08S35374W01	CP., 0.1μF
C122	08S82122F46	CP., 240pF
C123	08S82122F29	CP., 47pF
C124	08S35374W01	CP., 0.1μF
C130	08S35374W01	CP., 0.1μF

Symbol No.	Part No.	Description
C132	08T15399W03	CP., 0.047µF
C133	08T15399W04	CP., 0.027µF
C134	08T55487W02	CP., 0.22µF
C135	08S35374W01	CP., 0.1µF
C136	08S82122F37	CP., 100pF
C141	08T15399W04	CP., 0.027µF
C144	08T15399W04	CP., 0.027µF
C145	08T15399W03	CP., 0.047µF
C153	08S65128F58	CP., 1200pF
C191	08T15399W03	CP., 0.047µF
C201	08S82122F41	CP., 150pF
C202	08S82122F41	CP., 150pF
C205	08S82122F47	CP., 270pF
C206	08S82122F47	CP., 270pF
C207	08S82122F59	CP., 820pF
C208	08S82122F59	CP., 820pF
C233	08S82122F59	CP., 820pF
C234	08S82122F59	CP., 820pF
C501	08S82122F43	CP., 180pF
C502	08T15399W04	CP., 0.027µF
C503	08S35374W01	CP., 0.1µF
C504	08T15399W04	CP., 0.027µF
C507	08T15399W04	CP., 0.027µF
C513	08S82122F43	CP., 180pF
C522	08T15399W04	CP., 0.027µF
C540	08S82122F51	CP., 390pF
C801	08T15399W04	CP., 0.027µF
C805	08T15399W04	CP., 0.027µF
E101	23S75372W02	ELY., 100µF / 10V
E103	23S75372W15	ELY., 1µF / 50V
E104	23T74437F21	TAN., 10µF / 10V
E105	23T74437F32	TAN., 10µF / 16V
E106	23T74437F30	TAN., 4.7µF / 16V
E113	23S75372W03	ELY., 220µF / 10V
E130	23S75372W01	ELY., 330µF / 6.3V
E131	23S75372W12	ELY., 0.33µF / 50V
E132	23S75372W01	ELY., 330µF / 6.3V
E201	23S75372W04	ELY., 10µF / 16V
E202	23S75372W04	ELY., 10µF / 16V
E203	23S75372W05	ELY., 22µF / 16V
E204	23S75372W05	ELY., 22µF / 16V
E205	23S75372W12	ELY., 0.33µF / 50V
E501	23S75372W13	ELY., 0.47µF / 50V
E502	23S75372W17	ELY., 3.3µF / 50V
E503	23S75372W04	ELY., 10µF / 16V
E504	23S75372W15	ELY., 1µF / 50V
E801	23T75427W01	ELY., 470µF / 16V
E802	23S75372W03	ELY., 220µF / 10V
E803	23S75372W06	ELY., 33µF / 16V

Symbol No.	Part No.	Description
E804	23S75372W06	ELY., 33µF / 16V
E808	23S75372W01	ELY., 330µF / 6.3V
Resistors		(All resistors are chip 1/10W±5% unless otherwise noted.)
R101	06S64995F78	11K ohm
R102	06S64996F10	220K ohm
R103	06S64996F11	240K ohm
R104	06S64995F91	39K ohm
R105	06S64995F91	39K ohm
R106	06S64996F06	150K ohm
R107	06S64995F77	10K ohm
R108	——	Jumper
R109	06S64996F04	120K ohm
R110	06S64996F26	1M ohm
R111	06S64996F02	100K ohm
R112	06S64995F45	470 ohm
R113	06S64995F88	30K ohm
R114	06S64995F59	1.8K ohm
R115	06S64996F04	120K ohm
R116	06S64995F29	100 ohm
R117	06S64995F29	100 ohm
R118	06S64995F53	1K ohm
R120	——	Jumper
R121	06S64995F63	2.7K ohm
R122	06S64995F53	1K ohm
R123	06S64996F10	220K ohm
R124	06S64996F10	220K ohm
R125	——	Jumper
R126	06S64995F83	18K ohm
R127	06S64995F77	10K ohm
R130	06S64995F76	9.1K ohm
R131	06S64996F01	91K ohm
R132	——	Jumper
R133	06S64995F78	11K ohm
R134	06S64995F60	2K ohm
R141	06S70072F13	22 ohm 1/4W
R142	——	Jumper
R143	06S64996F06	150K ohm
R144	06S64995F43	390 ohm
R145	06S64995F94	51K ohm
R146	06S64995F89	33K ohm
R147	06S64995F50	750 ohm
R149	——	Jumper
R152	06S64995F50	750 ohm
R154	06S64995F85	22K ohm
R155	06S64995F85	22K ohm
R156	——	Jumper

Symbol No.	Part No.	Description
R157	——	Jumper
R159	06S64995F77	10K ohm
R160	06S64995F90	36K ohm
R161	06S64995F90	36K ohm
R162	06S64996F10	220K ohm
R163	06S64996F10	220K ohm
R165	06S64995F93	47K ohm
R191	06S64995F69	4.7K ohm
R192	06S64995F69	4.7K ohm
R193	06S64995F69	4.7K ohm
R194	06S64995F77	10K ohm
R197	06S64995F25	68 ohm
R201	06S64995F72	6.2K ohm
R202	06S64995F72	6.2K ohm
R203	06S64995F82	16K ohm
R204	06S64995F82	16K ohm
R207	06S64995F61	2.2K ohm
R208	06S64995F61	2.2K ohm
R209	06S64995F81	15K ohm
R210	06S64995F81	15K ohm
R213	06S64995F50	750 ohm
R214	06S64995F50	750 ohm
R225	06S64995F86	24K ohm
R226	06S64995F86	24K ohm
R227	06S64995F21	47 ohm
R228	06S64995F21	47 ohm
R229	06S64995F78	11K ohm
R230	06S64995F78	11K ohm
R235	06S64995F50	750 ohm
R241	06S64996F11	240K ohm
R242	06S64996F11	240K ohm
R505	06S64995F93	47K ohm
R506	06S64995F93	47K ohm
R507	06S64995F93	47K ohm
R508	06S64995F93	47K ohm
R509	06S64995F93	47K ohm
R513	06S64995F98	75K ohm
R514	06S64995F77	10K ohm
R515	06S53331F41	1 ohm 1/8W
R516	06S64995F77	10K ohm
R518	06S64995F50	750 ohm
R525	——	Jumper 1/8W
R535	06S64995F77	10K ohm
R536	06S64995F93	47K ohm
R540	06S64995F85	22K ohm
R541	06S53330F85	22K ohm 1/8W
R542	06S70072F37	220 ohm 1/4W
R551	06S95214F14	330K ohm 1/8W
R552	06S95214F13	120K ohm 1/8W

Symbol No.	Part No.	Description
R554	06S64995F93	47K ohm
R556	06S64995F95	56K ohm
R559	06S64995F53	1K ohm
R603	06S64995F93	47K ohm
R701	——	Jumper
R801	06S70072F34	160 ohm 1/4W
R802	06S70072F34	160 ohm 1/4W

Connectors

CB501	09T90625F54	WTB, TXL-04PL
CB502	09T45435W10	FFC, 52207-1090
CB503	09T45434W15	FFC, 52271-1590
CB801	09T45434W11	FFC, 52271-1190

Connector P.W.Board

Capacitor

C910	08S82122F59	CP., 820pF

Resistors (All resistors are chip 1/4W±5% unless otherwise noted.)

R920	06S70072F05	10 ohm
R921	06S70072F05	10 ohm
R922	06S70072F45	470 ohm

Connectors

CB901	09T45435W11	FFC, 52207-1190
CB902	09T55229W59	WTB, SC25-09WN

Elevator P.W.Board

CH501	01T65226W01	Assy., Wire Motor 4P

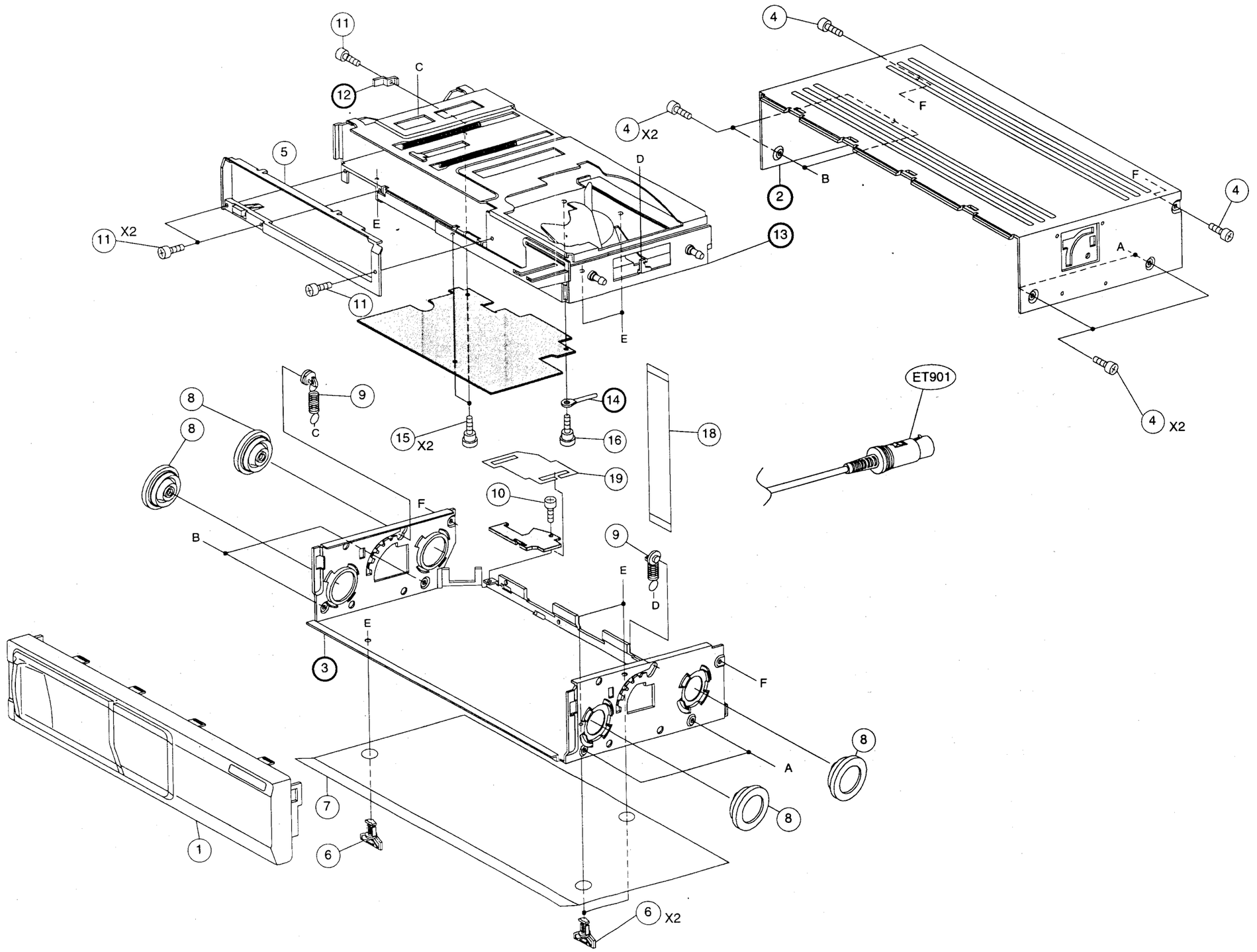
Miscellaneous

ET901	01T75325W01	Assy., DIN Connector

Symbol No.	Part No.	Description
HD101	81B10425Y01	Pick-Up Unit, EP21A610
M101	59T65085W01	Motor, Loading (7V-370mA)
M102	59T65085W01	Motor, Elevator (7V-370mA)
M103	59T65085W01	Motor, Sled (7V-370mA)
M104	01V83900W16	Assy., Spindle Motor (2V-90mA)
SW101	40T35543W02	Switch, Detector (UNLOAD)
SW102	40T35543W02	Switch, Detector (LOADING)
SW104	40T15222W01	Switch, Detector (MAGAZINE IN)
SW105	40T71025F03	Switch, Detector (LIMIT)
VR101	18T55678W01	Volume, Slide RS32111 10K ohm

Symbol No.	Part No.	Description

Exploded View (Cabinet)



Cabinet Assembly Parts List

NOTE:Parts without part number are not supplied.

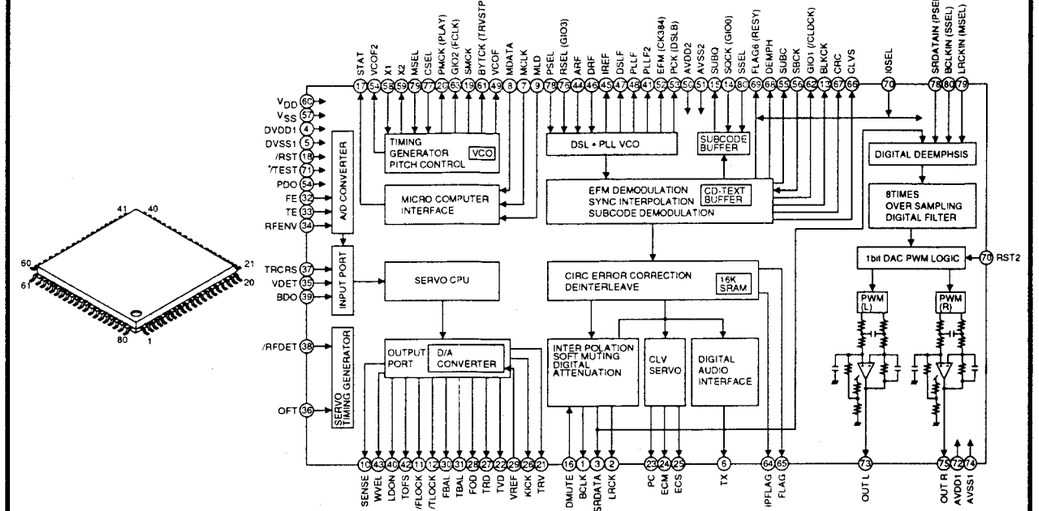
Symbol No.	Index	Part No.	Description
1	5-B	13T25267Y02	Assy., Front Escutcheon
4		03A61184W04	Screw, Bind (M2.6X5)
5	2-B	64C60211W01	Assy., Plate Inner
6		55A20491Y01	Key, Lock
7	5-C	54B20712Y01	Card, Caution
8		75C10781Y01	Damper, DT (D)
9		07A61053W04	Assy., Bracket Spring
10	3-D	03S38013W36	Screw, Bind (M2.6X4)
11		03S94385F48	Screw, Pan Nylok (M2X4)
15	3-C	03A38056W01	Screw, Special (M2.6X6)
16	3-D	03A38056W02	Screw, Special (M2.6X6)
18	3-F	30T65173W01	Wire, Flat
19	3-D	14A20715Y01	Insulator, P.W.Board

Symbol No.	Index	Part No.	Description

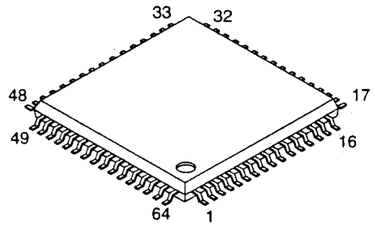
Semi-Conductor Lead Identifications

NOTE : For the parts not mentioned, refer to the Schematic Diagram.

MN662748RPM: IC101



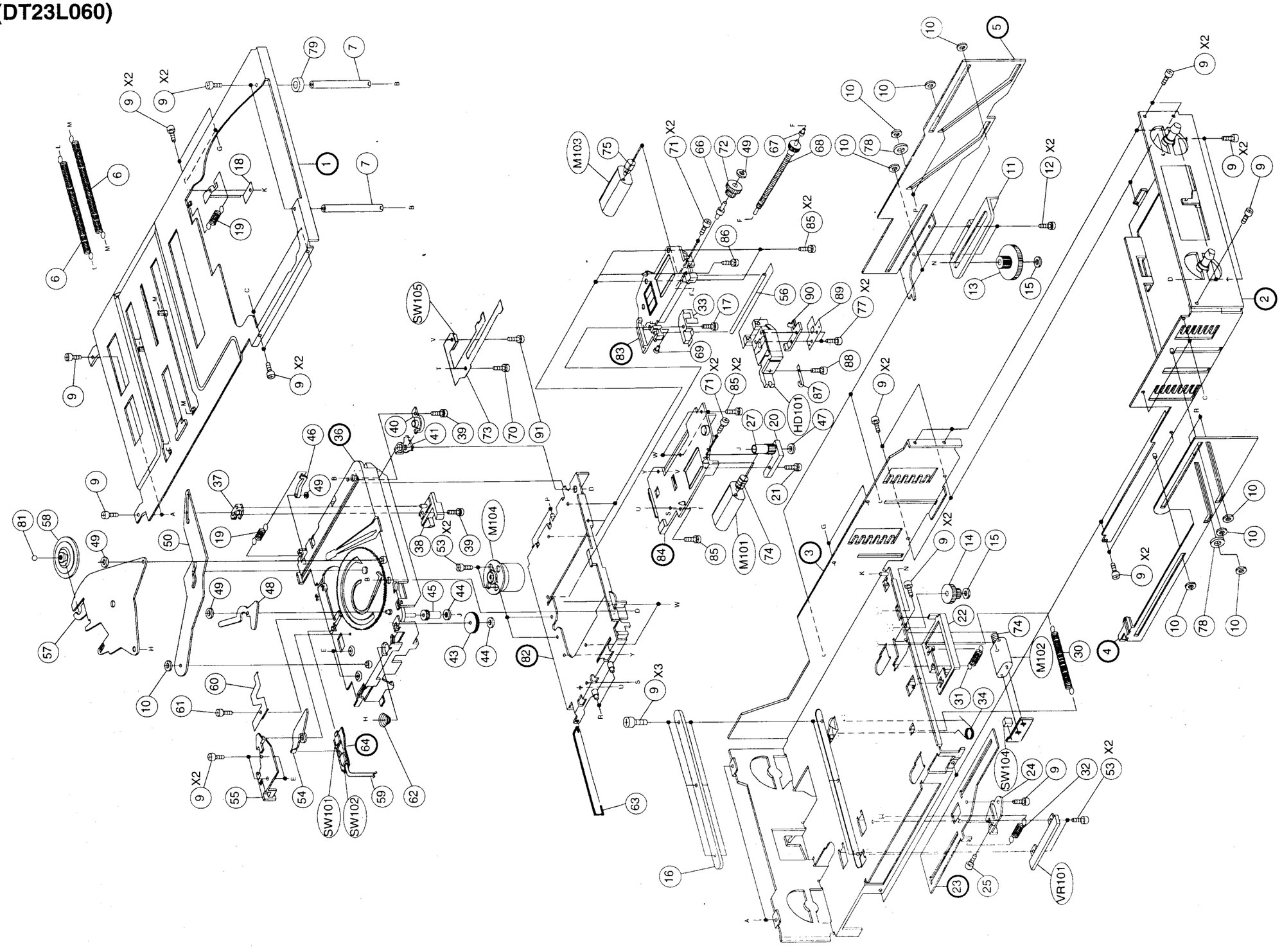
25203Y01 : IC501



PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O	PIN NO.	CODE ADDRESS	I/O
1	NC	—	17	NC	—	33	A MUTE	O	49	DOSW	I
2	BUS OUT	O	18	GND	I	34	V CONT	O	50	ULDSW	I
3	NC	—	19	NC	—	35	$\overline{\text{RESET}}$	I	51	LODSW	I
4	NC	—	20	NC	—	36	IRQ/BI	I	52	MAGSW	I
5	NC	—	21	NC	—	37	BATT	I	53	LMTSW	I
6	SCL	—	22	STAT	I	38	ACC	I	54	EJKEY	I
7	SDA	—	23	TLOCK	I	39	BLKCK	I	55	A_{VDD}	—
8	NC	—	24	V_{SS}	—	40	V_{DD}	—	56	A_{VREF}	—
9	V_{SS}	—	25	FLOCK	I	41	X2	—	57	SUBQ	I
10	A0 (LT)	O	26	SENSE	I	42	X1	—	58	NC	—
11	A1 (CK)	O	27	NC	—	43	GND	—	59	SQCK	O
12	A2 (DT)	O	28	MLD	O	44	NC	—	60	NC	—
13	ELVM +	O	29	MDATA	O	45	GND	—	61	NC	—
14	ELVM -	O	30	MCLK	O	46	A_{VSS}	—	62	NC	—
15	LODM +	O	31	XRST	O	47	LPS	I	63	NC	—
16	LODM -	O	32	D MUTE	O	48	TEMP	I	64	NC	—

Exploded View (CD Mechanism)

(DT23L060)



CD Mechanism Assembly Parts List

NOTE:Parts without part number are not supplied.

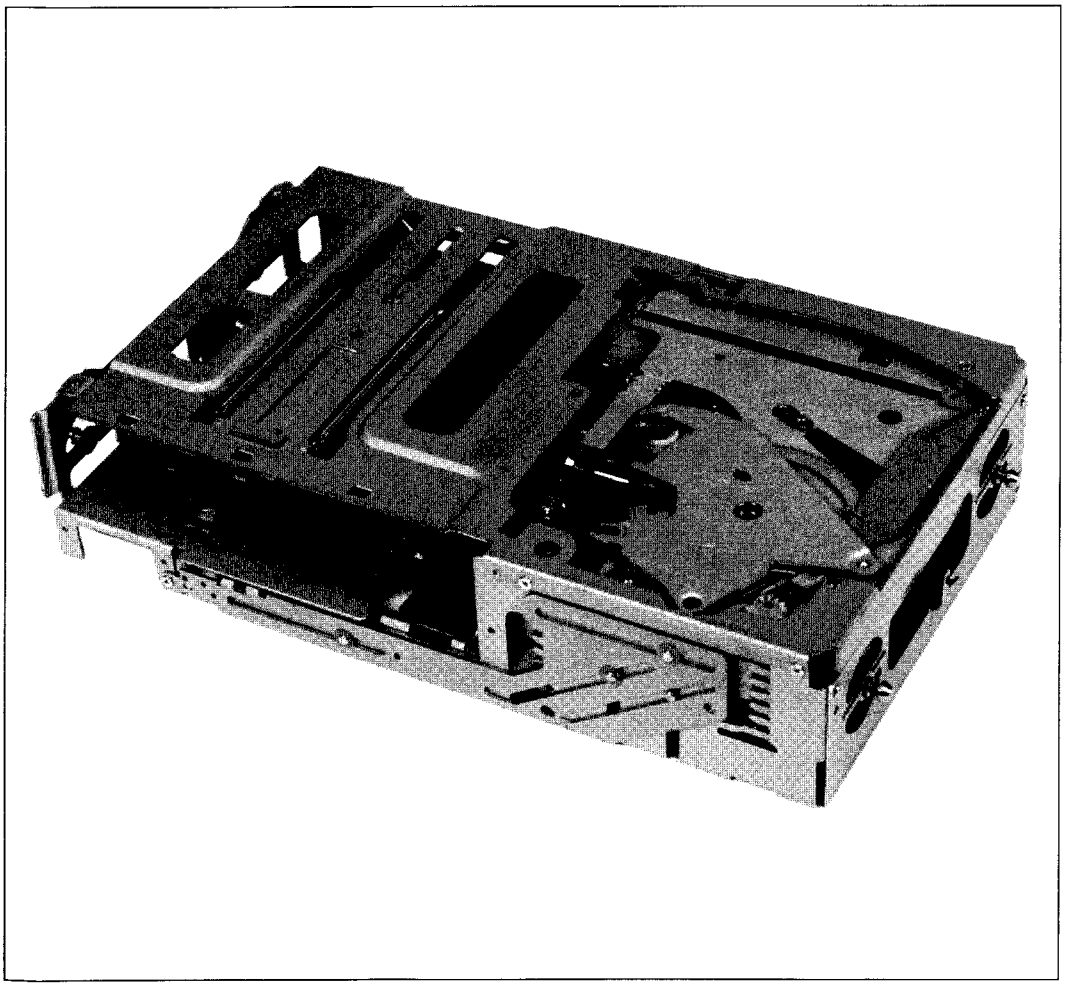
Symbol No.	Index	Part No.	Description
6		41B51993W01	Spring, Extension
7		47A51917W01	Shaft, Guide
9		03S94385F19	Screw, Pan Nylok (M2X2.5)
10		04B41345P22	Washer, Lock (M2.6)
11	2-F	44B51886W01	Rack, Elevator
12	2-F	03S40014G07	Screw, W / Washer (M2X4)
13	2-F	44A60088W01	Gear, Rack
14	3-F	44A60089W01	Gear, Wheel
15		04B41345P24	Washer, Lock (M2.1)
16	5-D	15A51889W01	Guide, Magazine
17	2-E	03D40121T56	Screw, W / Double Washer (M2X4)
18	2-B	45A51880W01	Stopper, Tray
19		41B51993W02	Spring, Extension
20	3-E	45A60160W01	Spacer, Bracket Motor
21	3-E	03S40014G16	Screw, W/Washer (M2X14)
22	4-F	45A51874W01	Slide, Magazine Switch
24	5-F	07A51882W01	Bracket, Sensor
25	5-F	03S94385F11	Screw, Pan Nylok (M2X5.2)
27	3-E	44A52035W01	Gear, Drive
30	4-F	41B51993W03	Spring, Extension
31	4-F	41B51993W04	Spring, Extension
32	5-G	41B51993W05	Spring, Extension
33	2-E	07B91155W01	Stopper, Shaft (B)
34	4-F	41A51996W01	Spring, Torsion
37	3-B	01A51932W01	Assy., Riv. Bracket Push Pull
38	3-C	45A51898W01	Arm, Push Pull
39	3-C	03S40014G61	Screw, W / Washer (M2X5)
40	3-C	15A51890W01	Guide, Chassis Tray
41	3-C	07A51884W01	Bracket, Corner
43	4-C	44A52036W01	Gear, Cam
44	4-C	04B41345P15	Washer, Lock (M1.2)
45	4-C	44A51896W01	Gear, Driven
46	3-C	45A51894W01	Arm, Tray (A)
47	3-E	04B41345P02	Washer, Lock (M1.7)
48	4-B	01A51937W01	Assy., Riv. Lever Slide
49		04B41345P12	Washer, Lock (M1.7)
50	3-B	45A52034W01	Lever, Cam
53		03S94385F01	Screw, Pan Nylok (M1.7X2.3)
54	5-B	45A51887W01	Arm, Switch
55	5-B	15B51891W01	Guide, Tray Side
56	2-E	47A60169W01	Shaft, Pick-Up
57	4-A	07B51879W01	Bracket, Clamper
58	3-A	43A91063W01	Table, Clamper-D
59	5-C	84T65057W01	FPC Switch P.W.Board
60	4-B	41A91064W01	Spring, Clamper
61	4-B	03S94385F07	Screw, Pan Nylok (M2X2)
62	5-C	41A51995W01	Spring, Compression
63	5-D	41A51923W01	Spring, Rod
66	2-E	46A60171W01	Stud, Middle
67	2-E	43A60164W01	Bush, Screw (A)
68	2-E	01V61300W99	Assy., Shaft Screw
69	3-E	43A60165W01	Bush, Screw (B)
70	3-D	03S40014G62	Screw, W / Washer (M2X3)
71		03S94385F58	Screw, Pan Nylok (M2X3.5)
72	2-E	44A60162W01	Gear, Middle
73	3-C	84T15533Y01	FPC Drive P.W.Board
74		44A10811Y01	Worm, STD
75	2-D	44A60161W01	Gear, Motor
77	2-E	03S94385F10	Screw, Pan Nylok (M2X4)
78		04B41345P05	Washer, Lock (M3.5)
79	1-C	75A80830W01	Rubber, Sleeve
81	3-A	43A70360W01	Steel, Ball
85		03S40014G66	Screw, W/Washer (M2X3.5)
86	2-E	03S40014G84	Screw, W/Washer (M2X6.5)
87	3-E	41A11040Y01	Spring, Sled-HOE
88	3-E	03S72235F81	Screw, Pan (M1.4X2)
89	2-E	41A11099Y01	Spring, Nut (A)
90	2-E	44A11101Y01	Spring, Nut (B)
91	3-D	03S40014G75	Screw, W/Washer (M2X9)

ALPINE®

SERVICE MANUAL

CD Changer Mechanism

CD Shuttle



DT SERIES

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Disassembly Instructions

1. Removal of Riv. Chassis Top Assembly

(1) Remove the spring (1) as shown in Figure 1.
(2) Remove the screw (2) as shown in Figure 1.

1. リベッティング シャーシ トップ組立の外し方

(1) 1本のバネ (1) を外します。(1図参照)
(2) 1本のネジ (2) を外します。(1図参照)

2. Removal of Cam Slider (B)

(1) Remove the four washers (3) as shown in Fugere 1.

2. カム スライダー(B) の外し方

(1) 4個のワッシャー (3) を外します。

3. Removal of Cam Slider (A)

(1) Remove the Rack Gear, by removing the washer (4) as shown in Figure 2.
(2) Remove the Elevator Rack, by removing two screw (5) as shown in Figure 2.
(3) Remove the four washer (6) as shown in Figure 2.

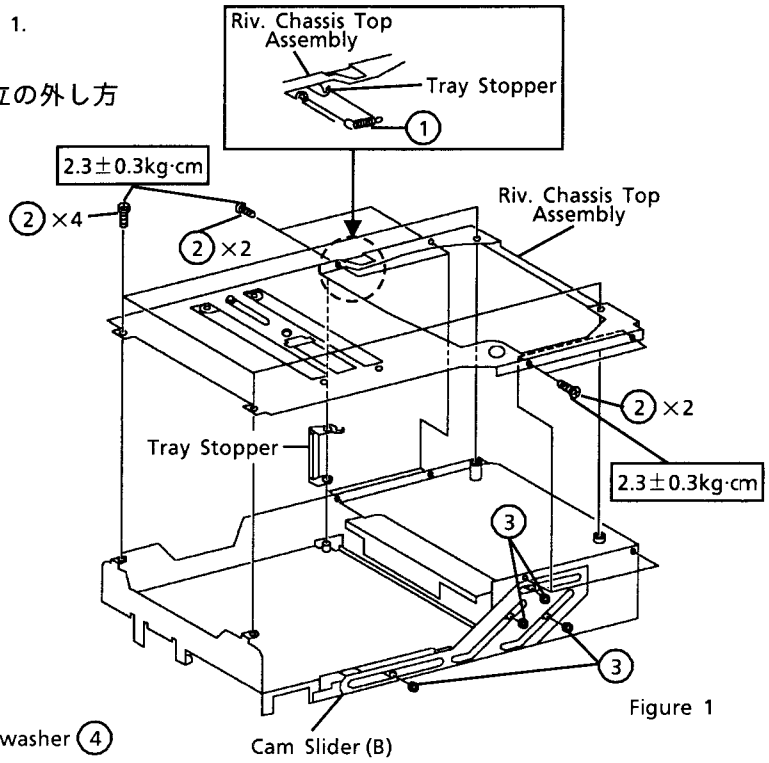


Figure 1

3. カム スライダー(A) の外し方

(1) 1個のワッシャー (4) を外して, ラックギアを外します。(2図参照)
(2) 2本のネジ (5) を外して, エレベーターラックを外します。(2図参照)
(3) 4個のワッシャー (6) を外します。

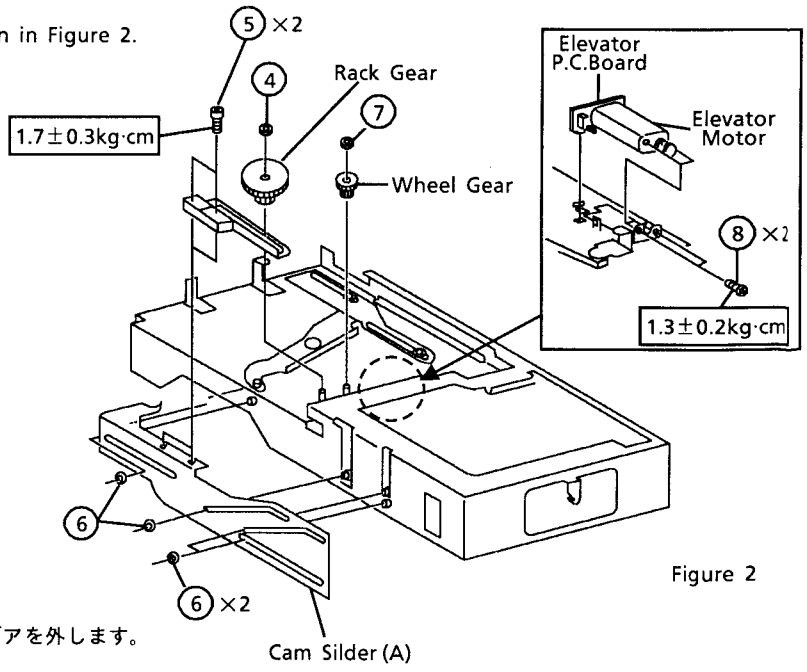


Figure 2

4. Removal of Elevator Motor

(1) After removal of Elevator Rack, remove the Wheel Gear by removing the washer (7) as shown in Figure 2.
(2) Remove the two screws (8) as shown in Figure 3.
(3) Elevator Motor with the Elevator P.C.Board can be removed completely.

4. エレベーターモーター の外し方

(1) エレベーターラックを外した後, 1個のワッシャー (7) を外して, ホイールギアを外します。(2図参照)
(2) 2本のネジ (8) を外します。(3図参照)
(3) 以上でエレベーターモーターはエレベーター基板が付いた状態で外れます。

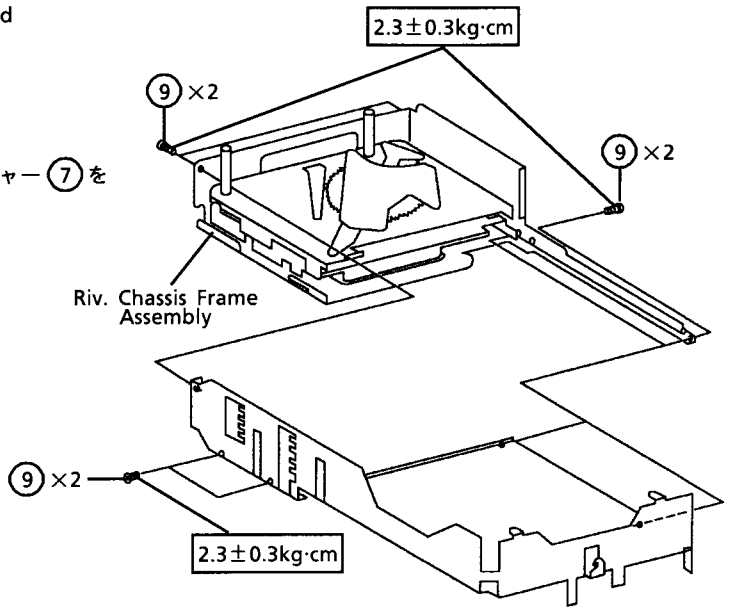


Figure 3

5. Removal of Chassis Frame Assembly

(1) Remove the six screws (9) as shown in Figure 3.

5. シャーシ フレーム組立 の外し方

(1) 6本のネジ (9) を外します。(3図参照)

6. Removal of Chassis Tray Assembly

(1) Remove the two screws (10) as shown in Figure 4.

6. シャーシ トレイ組立 の外し方

(1) 2本のネジ (10) を外します。(4図参照)

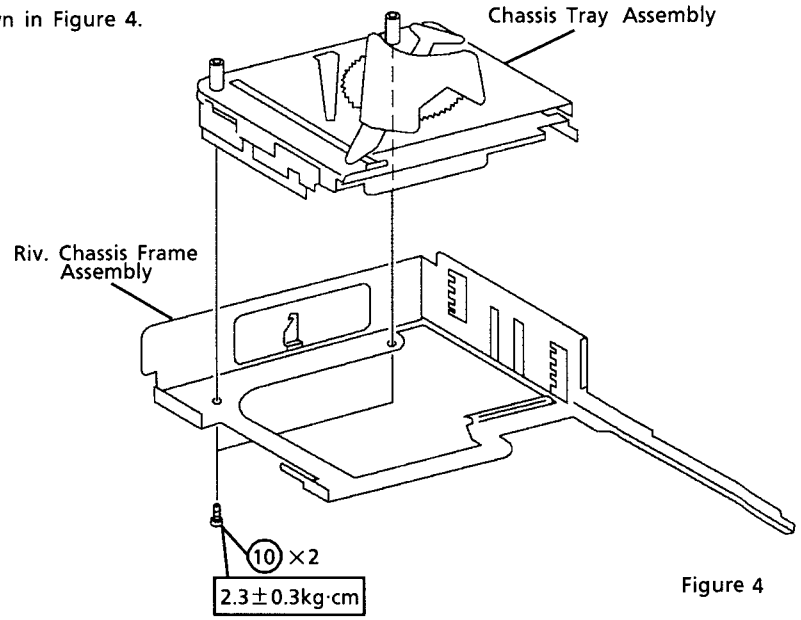


Figure 4

7. Removal of Drive Unit Assembly

(1) Remove the Three solders (11) as shown in Figure 5.
(2) Remove the Bracket Motor Assembly, by removing the screw (12) as shown in Figure 5.
(3) remove the Rod Spring as shown in Figure 5.

7. ドライブユニット組立の外し方

(1) 3箇所の半田(11)を外します。(5図参照)
(2) 1本のネジ(12)を外して，ブラケットモーター組立を外します。(5図参照)
(3) ロッドバネを外します。(5図参照)

8. Removal of Switch P.C.Board

(1) Remove the three solders (13) as shown in Figure 6.
(2) Remove the Switch Arm and Tray Side Guide, by removing the two screws (14) as shown in Figure 6.

8. スイッチ基板の外し方

(1) 3箇所の半田(13)を外します。(6図参照)
(2) 2本のネジ(14)を外して，アーム スイッチとトレイサイドガイドを外します。(6図参照)

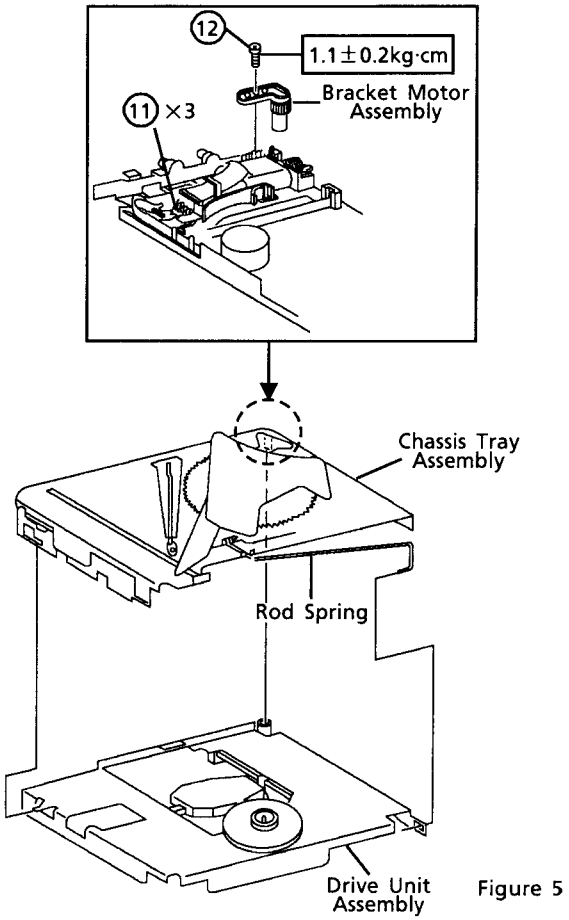


Figure 5

9. Removal of Sled Motor

(1) Remove the two solders (15) as shown in Figure 7.
(2) Remove the Middle Gear, by removing the washer (16) as shown in Figure 7.
(3) Remove the two screws (17) as shown in Figure 7.

9. スレッドモーターの外し方

(1) 2箇所の半田(15)を外します。(7図参照)
(2) 1個のワッシャー(16)を外して，ミドルギアを外します。(7図参照)
(3) 2本のネジ(17)を外します。(7図参照)

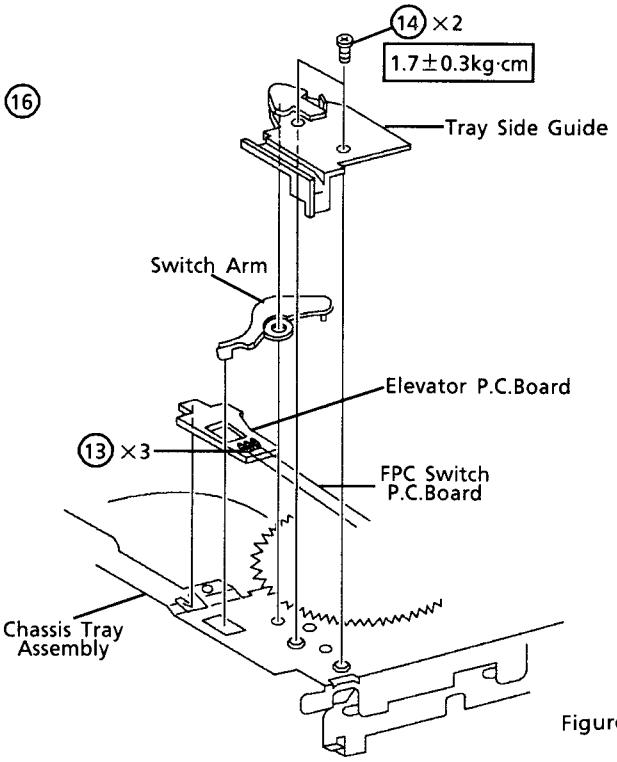


Figure 6

10. Removal of Loading Motor

(1) Remove the two solders (18) as shown in Figure 7.
(2) Remove the two screws (19) as shown in Figure 7.

10. ローディングモーターの外し方

(1) 2箇所の半田 (18) を外します。(7図参照)
(2) 2本のネジ (19) を外します。(7図参照)

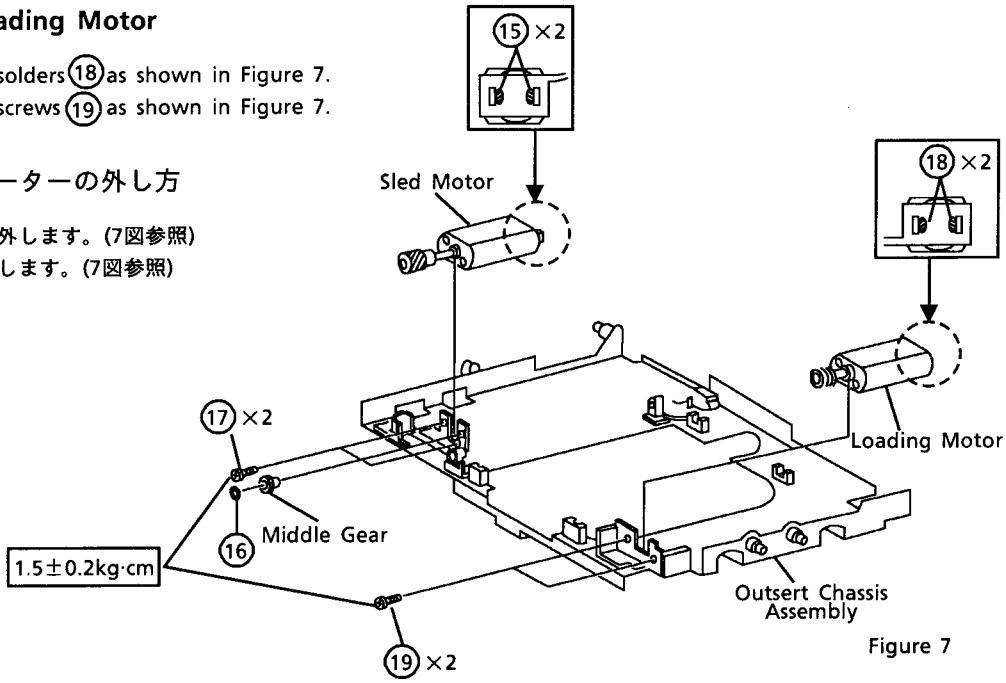


Figure 7

11. Removal of Pick Up Unit

(1) Remove the four solders (20) as shown in Figure 9.
(2) Remove the Shaft Stopper (A) / (B), by removing the two screws (21) as shown in Figure 8.
(3) Remove the two Shafts as shown in Figure 8.

11. プックアップユニットの外し方

(1) 4箇所の半田 (20) を外します。(9図参照)
(2) 2本のネジ (21) を外して, シャフトストッパー(A) / (B)を外します。(8図参照)
(3) 2本のシャフトを引き抜きます。(8図参照)

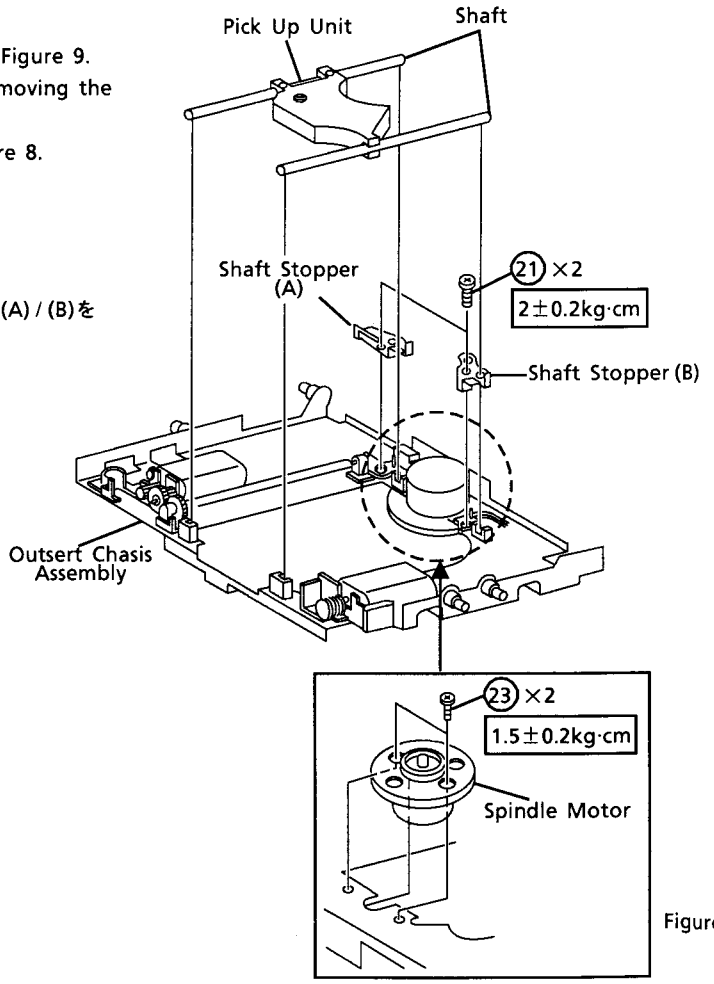


Figure 8

12. Removal of Spindle Motor

(1) Disconnect the RED and BLK wires, by removing the two solders (22) as shown in Figure 9.
(2) Remove two screws (23) as shown in Figure 8.

12. スピンドルモーターの外し方

(1) 2箇所の半田(22)を外して，赤 / 黒のワイヤーを外します。(9図参照)
(2) 2本のネジ(23)を外します。(8図参照)

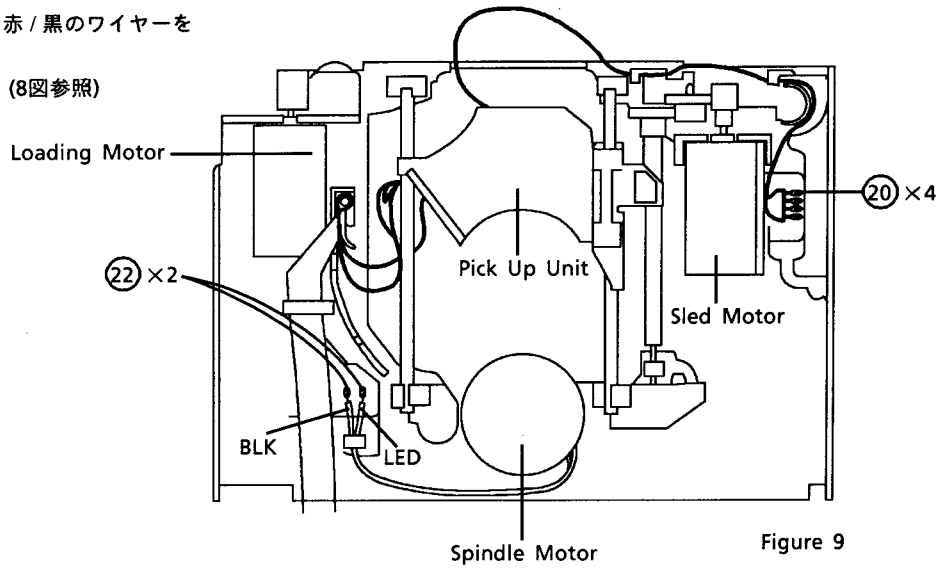


Figure 9

Mechanism Function Description

● Magazine Insertion

Step	Description	Illustration
1	When a magazine is inserted, the eject lever is pushed in.	Figure 10
2	Further insertion of the magazine causes the magazine lock arm to move.	
3	The magazine lock arm causes the magazine to lock. At the same time the thrust magazine switch is pushed and the magazine switch is turned off. (Confirmation of the magazine lock.)	

● マガジン挿入

順序	動 作 説 明	イラスト
1	マガジンを挿入するとイジェクト·レバーが押される。	10図
2	更に挿入するとマガジン·ロック·アームが動く。	
3	マガジン·ロック·アームによりマガジンがロックされ、同時にスライド·マガジン·スイッチが押されマガジン·スイッチがOFFする。(マガジンがロックされたことの確認)	

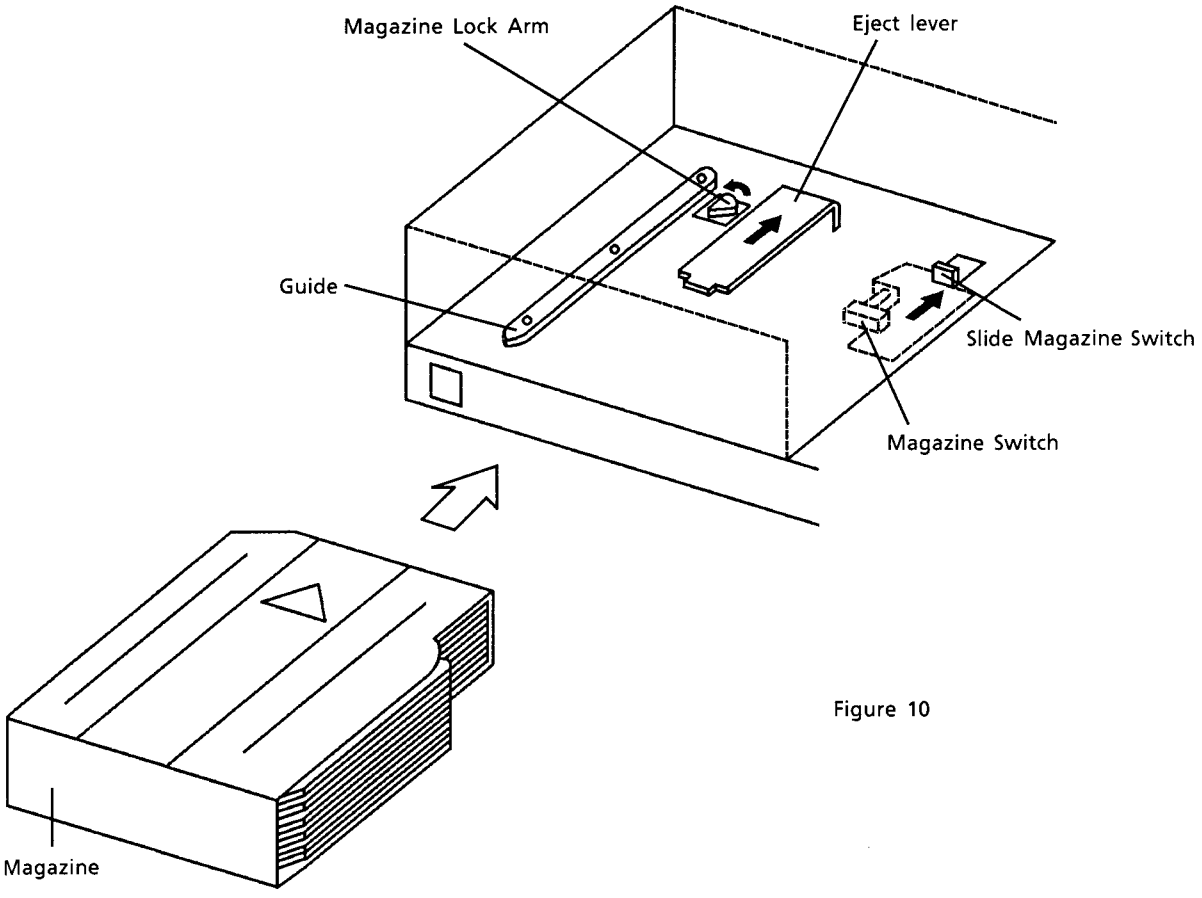


Figure 10

● DISC Loading

Step	Description	Illustration
1	The elevator motor rotates.	Figure 11
2	The rotation is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in Y direction and the slider cam (B) in X direction. Then, the chassis tray and the drive unit move in Q direction along to edges of the cams.	
4	Motion of the bracket sensor in X, Y directions moves the position sensor volume, thereby controlling movement distances of the chassis tray and the drive unit.	
5	The chassis is stopped at the first disc position in the magazine. (This operation is the same for 2nd through 6th discs except the movement distance of the chassis is different.)	
6	The loading motor rotates. (The loading motor can rotate in forward and reverse directions.)	
7	The rotation is transmitted to gears (E), (F), (G) and (H).	
8	The rotation of the gear (H) moves the arm push-pull in Y direction through the lever cam and takes out the tray from the magazine.	
9	In the same way as in the step (8), the rotation of gear (H) moves the slider lock claw at side of the chassis tray through the lover slider lock and engages it with the slit provided on the chassis frame, thus locking the chassis tray.	
10	In the same way as in the step (9), the rotation of gear (H) turns on the switch A through the arm switch. (Confirmation of the tray pulled into the chassis tray.)	
11	Steps 1 - 4 (step 3 for only the drive unit) are repeated again to bring the drive unit in the disc play position and then the disc is clamped by pressing the disc to the clamper.	

● DISC ローディング

順序	動 作 説 明	イラスト
1	エレベーター･モーターが回転する。	11図
2	ギア (A), (B), (C), (D)と動力が伝達する。	
3	ギア (D) の動力によりスライダー･カム (A) がY方向、スライダー･カム (B) がX方向に動き、カムのプロフィールに沿ってシャーシ･トレイ及びドライブ･ユニットがQ方向に動く。	
4	ブラケット･センサーがX, Y方向に動くことによって、ポジションセンサー･ボリュームを動かし、シャーシ･トレイ及びドライブ･ユニットの移動距離を制御する。	
5	マガジンの1枚目のトレイ位置にシャーシ･トレイを止める。(2~6枚目のトレイはシャーシ･トレイ停止位置が異なるだけで、動作は同様)	
6	ローディング･モーターが回転する。(正逆転可能)	
7	ギア (E), (F), (G), (H) と回転が伝達する。	

順序	動 作 説 明	イラスト
8	ギア (H) の回転動力によりレバー·カムを介し、アーム·プッシュプルをY方向に動かし、マガジンからトレイを引き出す。	11 図
9	項目8と同時に、ギア (H) の回転動力により、レバー·スライダー·ロックを介し、シャーシ·トレイの側面にあるスライダー·ロックの爪が動きシャーシ·フレームのスリット穴と勘合され、シャーシ·トレイがロックされる。	
10	項目9と同時に、ギア (H) の回転動力により、アーム·スイッチを介し、スイッチ (A) がONする。(トレイがシャーシ·トレイに引き込まれたことの確認)	
11	再び項目1~4の動作(項目3はドライブ·ユニットのみ)を行い、DISCプレイ位置にドライブ·ユニットを動かすことによって、DISCをクランパーに押しつけてDISCをクランプする。	

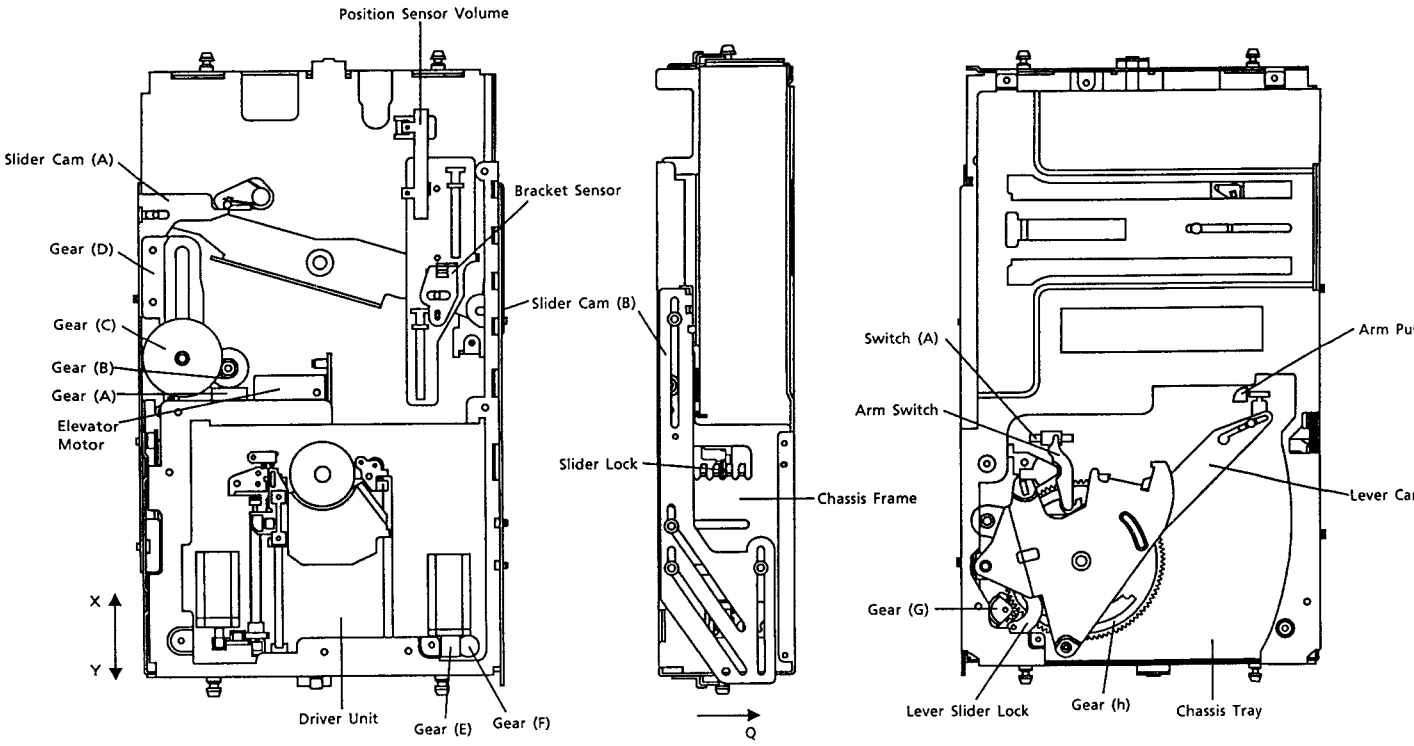


Figure 11

● Play

Step	Description	Illustration
1	The spindle motor rotates.	Figure 12
2	The rotation of the sled motor is transmitted through the gears to the feed screw and moves the pickup.	
3	The lead-in position of the disc is detected by the inner limit position switch and the reading of the disc data begins.	

● プレイ

順序	動 作 説 明	イラスト
1	スピンドル·モーターが回転する。	12図
2	スレッド·モーターの回転がギア (I), (J)を介して送りスクリューに伝えられ、ピック·アップを移動させる。	
3	内周リミットスイッチにより、DISCのリードイン位置を検知し、DISCの情報を読み始める。	

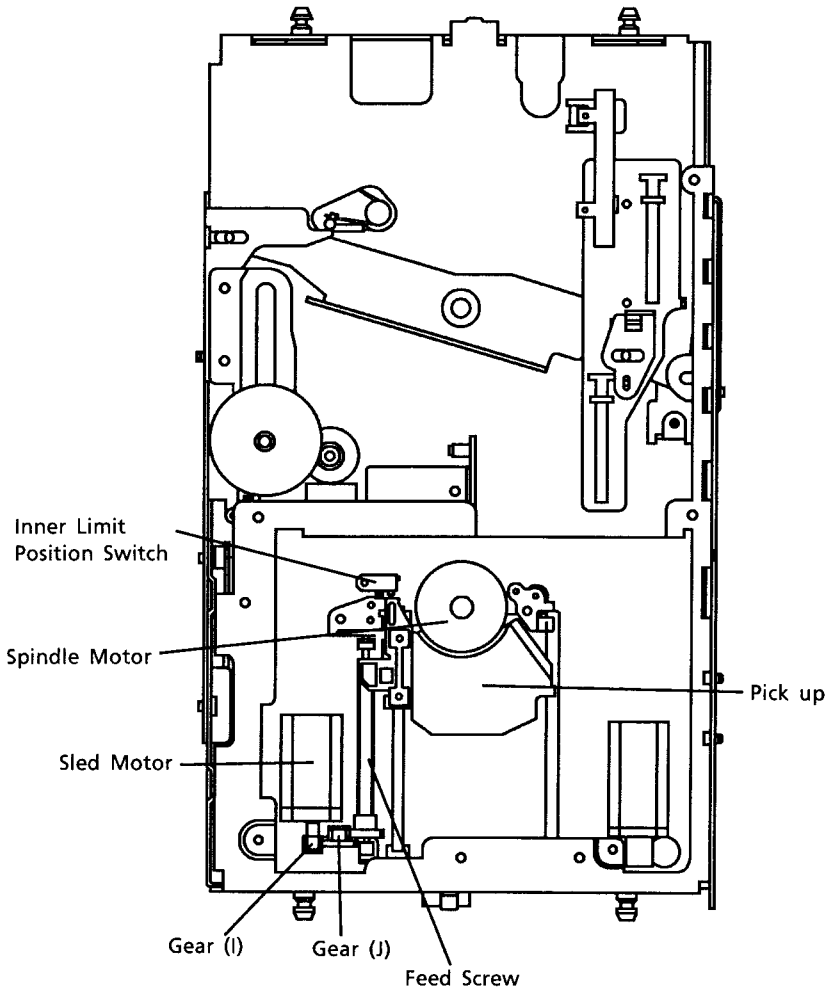


Figure 12

● Disc Unloading

Step	Description	Illustration
1	The elevator motor rotates.	Figure 13
2	The rotation of the motor is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in X direction and the slider cam (B) in Y direction, and the drive unit moves along to the edges of the cams, thereby releasing the disc clamp.	
4	The loading motor rotates.	
5	The rotation of the motor is transmitted to gears (E), (F), (G), and (H).	
6	The rotation of gear (H) is transmitted to the arm push-pull through the lever cam and this moves the arm push-pull in X direction, thereby housing the tray into the magazine.	
7	In the same way as in step (6), the rotation of the gear (H) moves the slider lock through the lever slider lock and releases the lock of the chassis tray.	
8	In the same way as in step (7), the rotation of the gear (H) turns on the switch (B) through the arm switch. (Confirmation of the tray housed in the magazine.)	

● DISC アンローディング

順序	動 作 説 明	イラスト
1	エレベーター･モーターが回転する。	13図
2	ギア(A), (B), (C), (D)と動力が伝達する。	
3	ギア(D)の動力により、スライダー･カム(A)がX方向、スライダー･カム(B)がY方向に動き、カムのプロフィールに沿ってドライブ･ユニットがP方向に動きDISCクランプを解除する。	
4	ローディング･モーターが回転する。	
5	ギア(E), (F), (G), (H)と回転が伝達する。	
6	ギア(H)の回転動力によりレバー･カムを介し、アーム･プッシュ･プルをX方向に動かし、トレイをマガジンに収納する。	
7	項目6と同時に、ギア(H)の回転動力により、レバー･スライダー･ロックを介し、スライダー･ロックを動かし、シャーシ･トレイのロックを解除する。	
8	項目7と同時に、ギア(H)の回転動力により、アーム･スイッチを介し、スイッチ(B)がONする。(トレイが、マガジンに収納されたことの確認)	

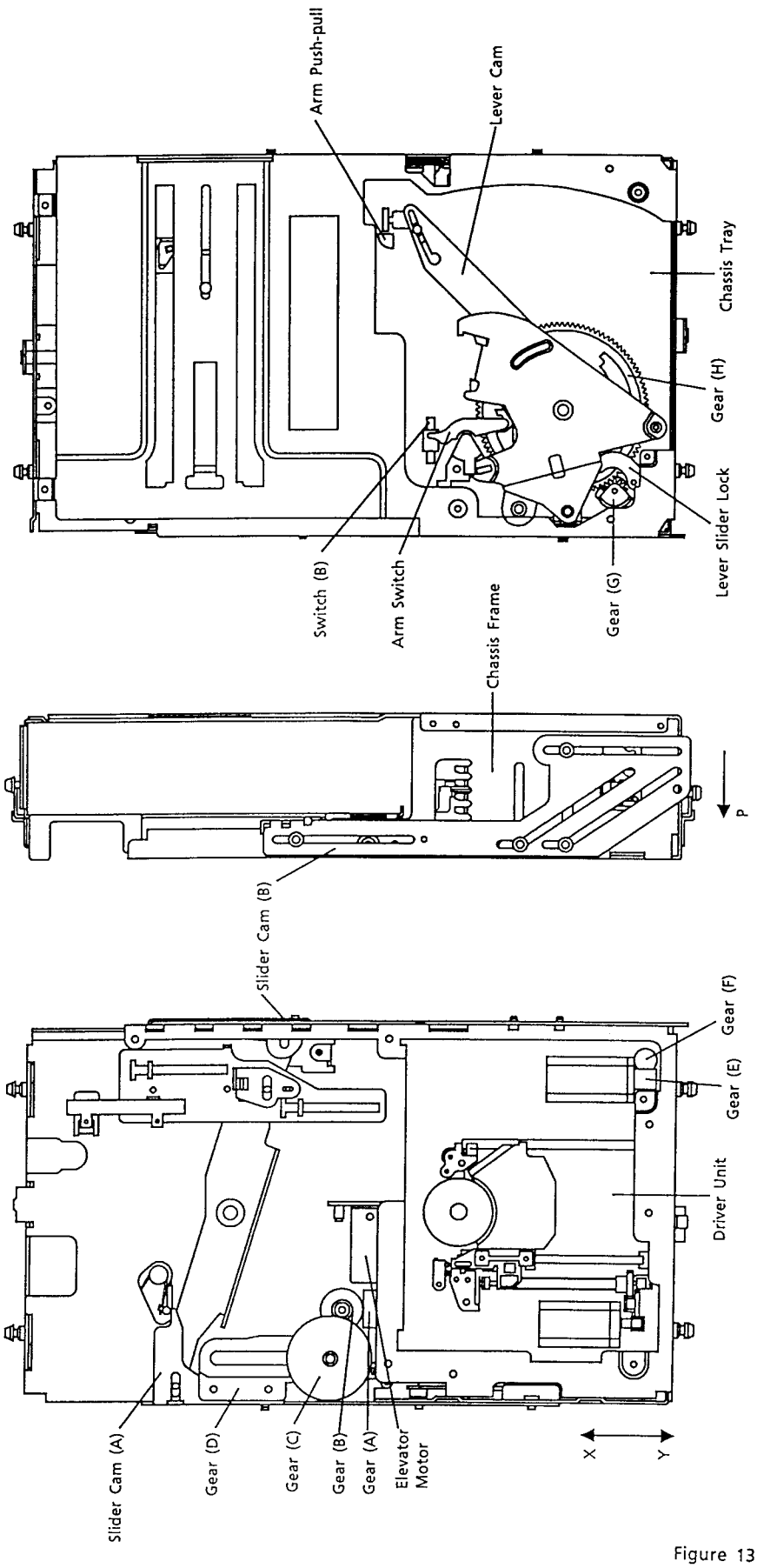

Arm Push-pull
Lever Cam
Chassis Tray
Gear (H)
Lever Slider Lock
Switch (B)
Arm Switch
Gear (G)
Chassis Frame
P
Slider Cam (B)
Gear (F)
Gear (E)
Driver Unit
Slider Cam (A)
Gear (D)
Gear (C)
Gear (B)
Gear (A)
Elevator Motor
X
Y

Figure 13

● Magazine Eject

Step	Description	Illustration
1	The elevator motor rotates.	Figure 14
2	The rotation is transmitted to gears (A), (B), (C), and (D).	
3	The rotation of the gear (D) moves the slider cam (A) in X direction, and pushes the magazine lock arm, thereby releasing the magazine lock.	
4	The force of the spring moves the eject lever in R direction and this ejects the magazine and turns on the magazine switch. (Confirmation of the magazine ejected.)	

● DISC イジェクト

順序	動 作 説 明	イラスト
1	エレベーター·モーターが回転する。	14 図
2	ギア(A), (B), (C), (D)と動力が伝達する。	
3	ギア(D)の動力により、スライダー·カム(A)がX方向に動きマガジン·ロック·アームを押し、マガジン·ロックが解除される。	
4	イジェクト·レバーがバネの力によりR方向に動きマガジンが排出され、マガジン·スイッチがONする。(マガジンを排出したことの確認)	

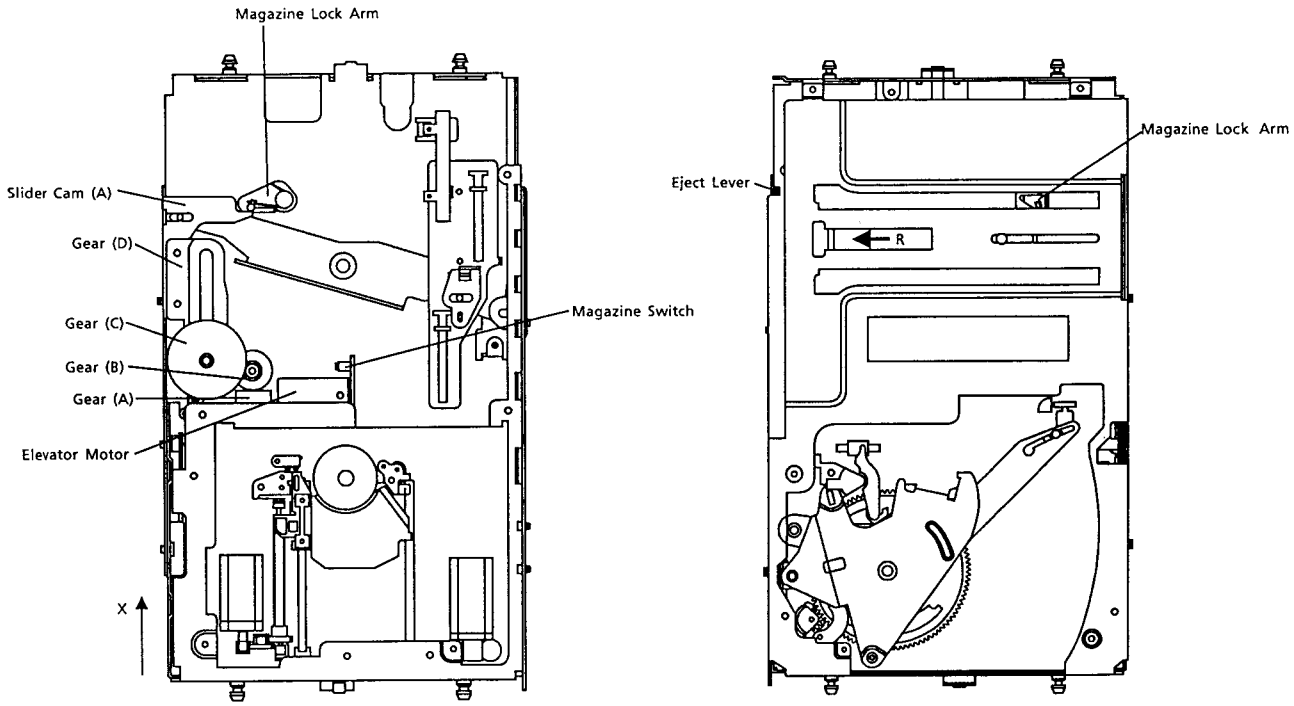


Figure 14

Timing Chart

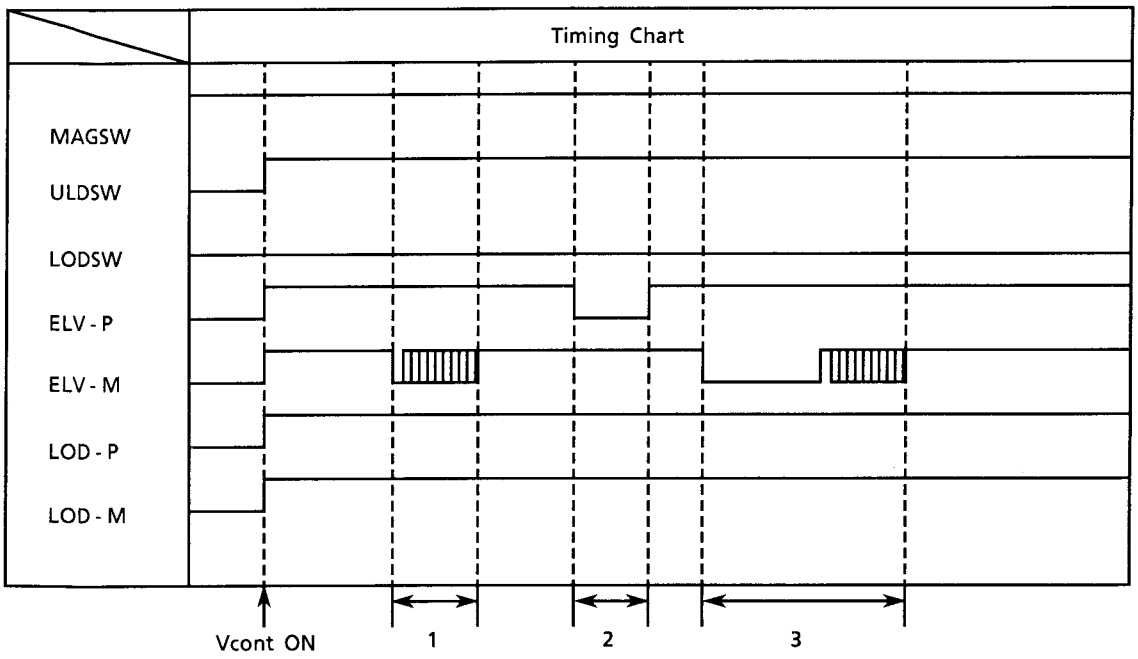
● Initialization (イニシャライズ動作)

Carried out when the unit is reset.

1. A blank eject operation is carried out when a magazine is not installed.
2. If the tray is pulled in (LODSW=L), one of two operations shown below is carried out.
   a. If the address is remembered in the EEPROM, nothing is carried out with the current conditions maintained.
   b. If the EEPROM does not exist, the address is identified by making a forced chucking.

リセットがかかった時に行う動作

1. マガジンなしの場合は、空イジェクト動作をする。
2. トレイを引き込んでいる場合 (LODSW=L) は、次の2つの場合がある。
   a. EEPROM で番地を覚えている場合は、そのまま何もしない。
   b. EEPROM がない場合は、強制チャッキングで番地を判断する。



Process contents

1	Forced chucking	When ULDSW is H and LODSW is L, the unit is in loading status, but chucking status is not judged with LPS only. So, forced chucking is carried out by moving the elevator upward with pulse signal for 3 seconds.
2	Releasing	Releases the chucking by moving the elevator downward. Microcomputer confirms a value of the linear position sensor and judges the disc position.
3	Chucking	As MAGSW is H, the mechanism chucks a disc, reads TOC, stops, and then waits commands from bus.
		* Condition to carry out the forced chucking : Unit without EEPROM is reset.

処理内容

1	強制 チャッキング	ULDSWがHでLODSWがLのときは、ローディングされている状態だが、チャッキングされているか否かは、LPSだけでは判断できない為、エレベーターを上方に3秒間パルス送りして強制的にチャッキングさせる。
2	リリース	エレベータを下方に移動させ、リリース(チャッキングを外す) μ-COMがリニアポジションセンサーの値を確認して、何枚目のポジションであるかを判断する。
3	チャッキング	MAGSWがHである為、ディスクをチャッキングしてTOCを読みSTOPしてからパスのコマンドを待つ。
		* 強制チャッキングを行う条件としては: EEPROMがなくてRESETがかかった場合。

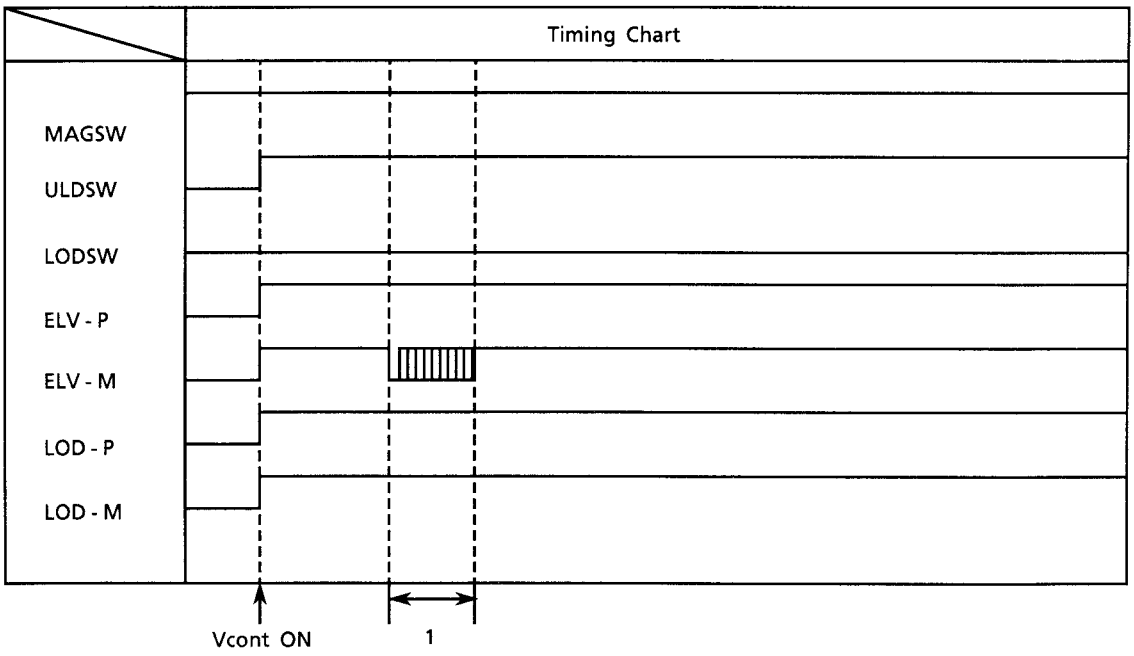
● Pressing operation (押し付け動作)

Pressing operation is carried out to perform precise chucking.

1. This operation is carried out when an operation mode is changed from Tape / Tuner to CD with the ACC / Power on after the reset.

正確にチャッキングするように押し付ける動作

1. リセット後にACC / POWERのONし、テープ / チューナーからCDになった時に行う。



Process contents

1	Pressing operation	As ULDSW is H and LODSW is L, a disc loaded is confirmed and the elevator is moved with pulse signal.
		* Pressing operation is an operation to remove a loosening.

処理内容

1	押し付け動作	ULDSWがH、LODSWがLであるためディスクがローディングさてれいることを確認して、エレベータをパルス送りにて移動させる。
		* 押し付け動作とは、緩みを取る為に行う動作をいう。

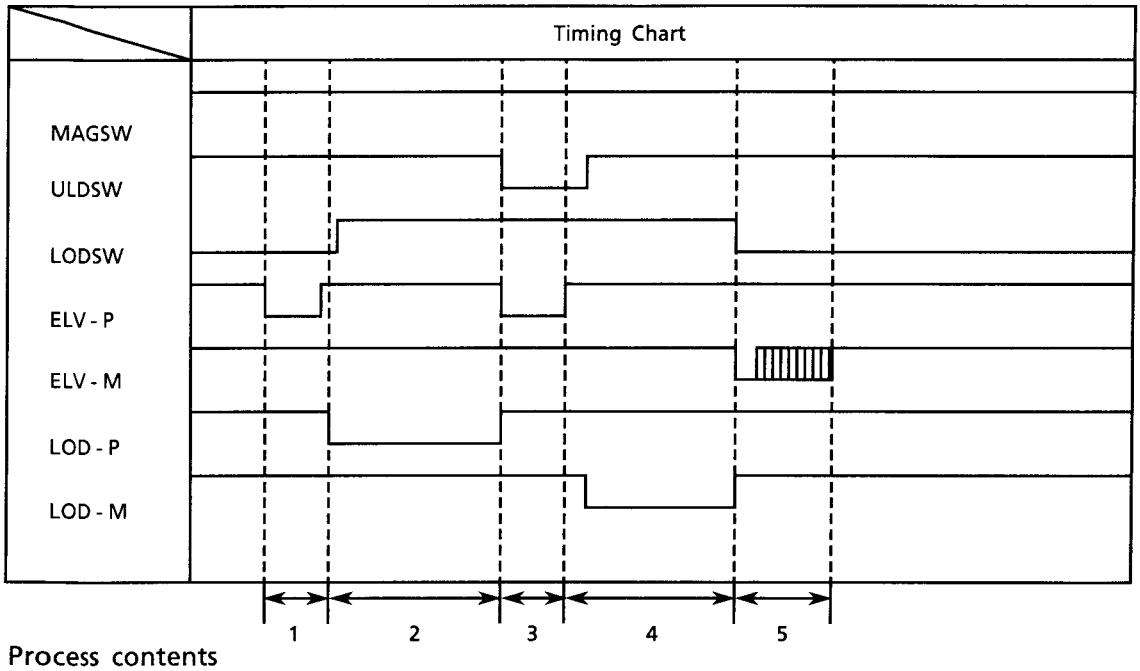
● Disc change operation (Example in downward operation) (ディスクチェンジ動作 (下向きの例))

Disc change operation from Mth disc to Nth disc.

1. Mth disc is released (MP→MT), unloading is carried out, and the elevator is moved (MT→NT), and then the loading and chucking operations are carried out (NT→MT).

M枚目からN枚目にDISCチェンジをする動作

1. M枚目をリリース (MP→MT) し、アンロードを行いエレベータを移動 (MT→NT) させローディ グ、チャッキング (NT→NP) する。



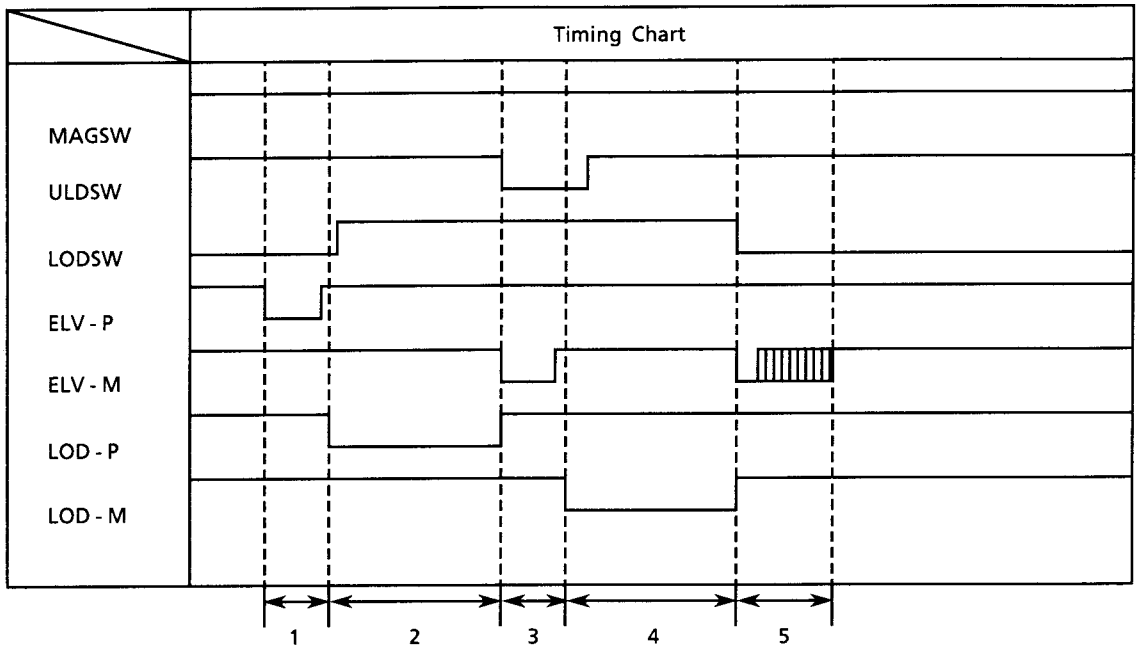
Process contents

1	Releasing	Moves the elevator downward and releases the chucking.
2	Unloading	Returns the disc to the tray. In this case, the operation completes at a falling edge of ULDSW [H→L (OFF→ON)].
3	Elevator downward	Moves the elevator downward and stops it when it reaches a predetermined pull-in position.
4	Loading	Pulls out the tray from the magazine. This operation completes when LODSW goes L (ON).
5	Chucking	Moves the elevator upward and chucks a disc. In this case, a final pulse is fed to make the chucking securely.

処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ディスクをトレイに戻す。この時ULDSWの立ち下がり[H→L (OFF→ON)] をもって動作終了となる。
3	エレベータ下向き	エレベータを下方に移動させ、目的の引き込み位置まで移動した時点でSTOPする。
4	ローディング	マガジンよりトレイを引き出す。LODSWがL (ON) になった時点で動作終了となる。
5	チャッキング	エレベータを上方に移動させ、チャッキングする。この際、最後にパルス送りで確実にチャッキングさせる。

● Disc change operation (Upward) (ディスクチェンジ動作 (上向きの例))



Process contents

1	Releasing	Moved the elevator downward and releases the chucking.
2	Unloading	Returns the disc to the tray. In this case, the operation completes at the falling edge of ULDSW [H→L (OFF→ON)].
3	Elevator downward	Moves the elevator upward and stops it when it reaches a predetermined pull-in position.
4	Loading	Takes out the tray from the magazine. Completes the operation when LODSW goes L (ON).
5	Chucking	Moves the elevator upward and chucks a disc. In this case, a final pulse is fed to make the chucking securely.

処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ディスクをトレイに戻す。この時ULDSWの立ち下がり[H→L (OFF→ON)] をもって動作終了となる。
3	エレベータ下向き	エレベータを上方に移動させ、目的の引き込み位置まで移動した時点でSTOPする。
4	ローディング	マガジンよりトレイを引き出す。LODSWがL (ON) になった時点で動作終了となる。
5	チャッキング	エレベータを上方に移動させ、チャッキングする。この際、最後にパルス送りで確実にチャッキングさせる。

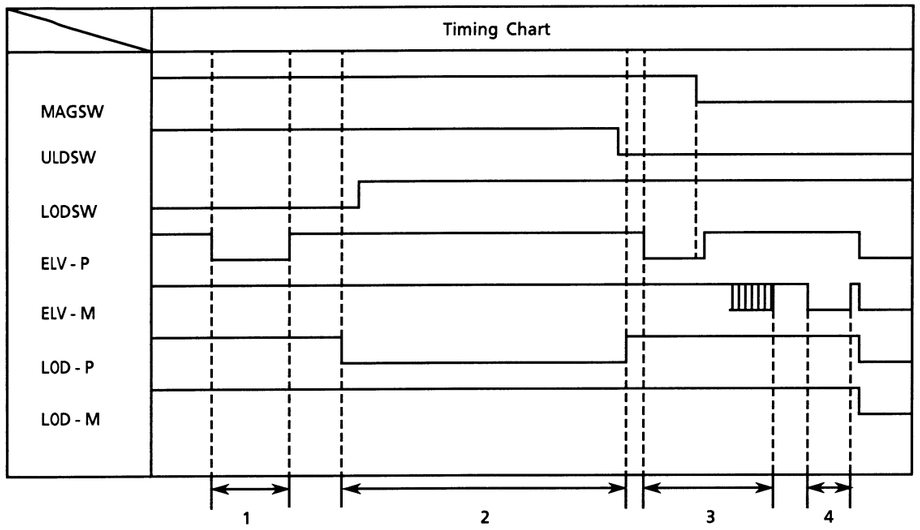
● Eject operation (イジェクト動作)

Operation to reject the magazine

1. Releases Mth disc (MP→MT), performs unloading, moves the elevator (MT→E) to release the lock, moves the elevator (E→2T), and then enters the standby condition.

マガジンをイジェクトする動作

1. M枚目をリリース (MP→MT))し、アンロード後エレベータを移動 (MT→E) してロックを外し、エレベータを移動 (E→2T) して待機状態になる。



Process contents

1	Releasing	Moved the elevator downward and releases the chucking.
2	Unloading	With ULDSW=H, LODSW=L the tray is in a loading status, so unloading operation is carried out. When ULDSW changes from H to L, LODM is stopped.
3	Eject	Moves the elevator downward and lowers it up to the eject position. Releases the magazine lock and confirms MAGSW. In this case, if MAGSW=L, the elevator is moved up to 1T position with a pulse signal.
4	Elevator shift	The elevator is moved to 1t position, and then moved to 2T position, and then eject operation completes. (Standby status)

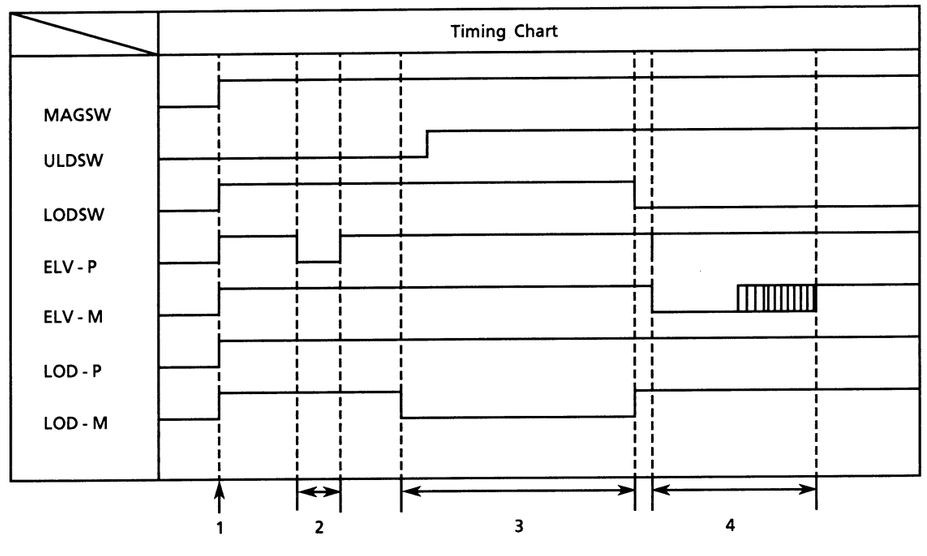
処理内容

1	リリース	エレベータを下方に移動させチャッキングを外す。
2	アンロード	ULDSWがH, LODSWがL の時にはトレイがローディングされている状態なので、アンローディング動作を行う。ULDSWが H→L となるとLODMをストップさせる。
3	イジェクト	エレベータを下方に移動させ、イジェクト位置まで下降させる。ここでマガジンロックを解除し、MAGSWを確認する。この時MAGSWがL の場合にはエレベーターを1Tの位置までパルス送りで移動させる。
4	エレベータ移動	エレベータが1Tの位置まで移動した後、エレベーターは2Tの位置まで移動しイジェクト動作が終了する。(スタンバイ状態)

● Magazine insertion operation (マガジン挿入時の動作)

1. When a magazine is inserted, first disc is pulled-in and chucked.

1. マガジンが挿入されたときは、1枚目を引き込んでチャッキングする。



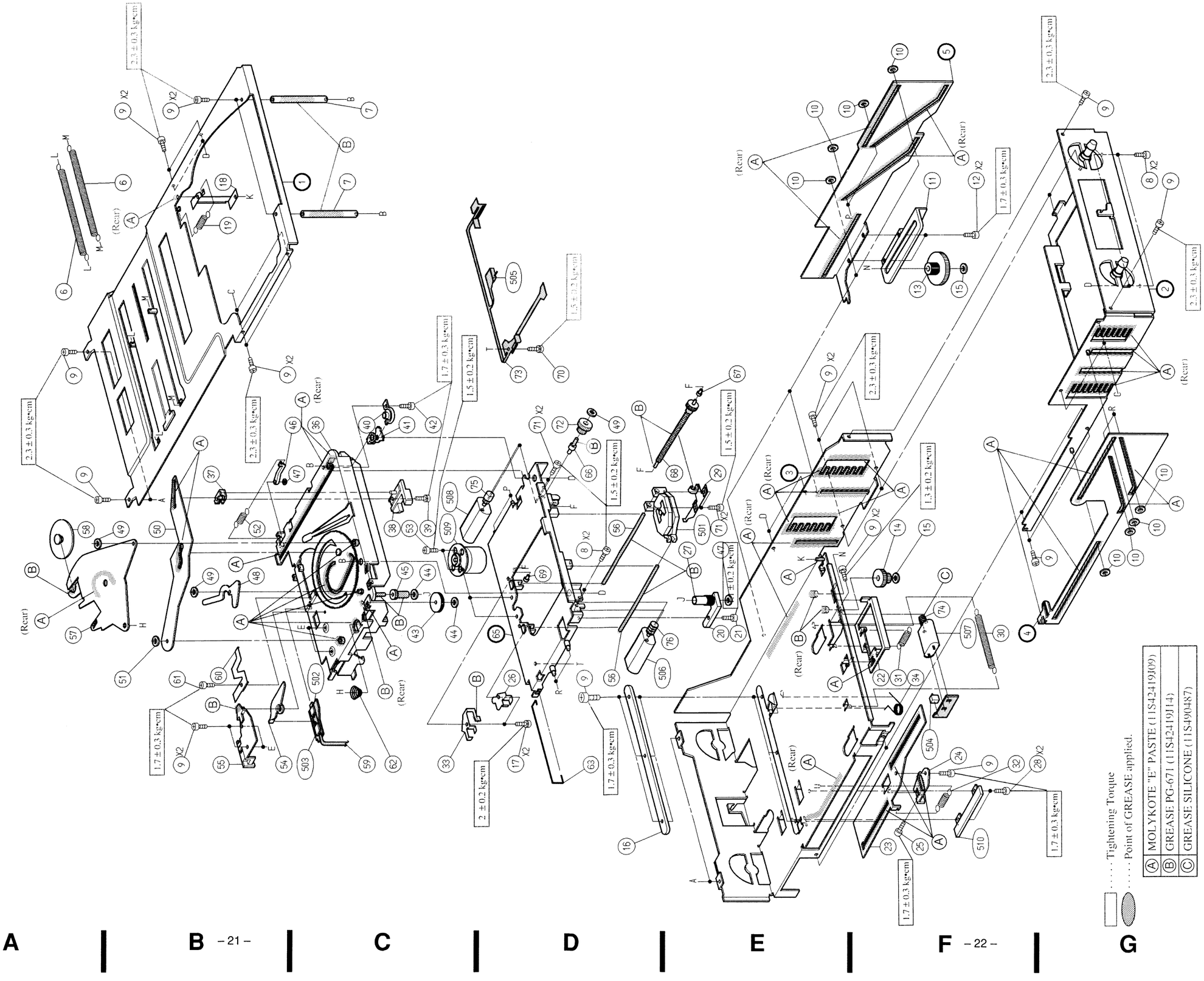
Process contents

1	Magazine insertion	When the magazine is inserted, MAGSW goes H.
2	Elevator shift	First, the elevator moves downward and moves to a specified pull-in position.
3	Loading	The loading motor rotates in forward and pulls in the tray. This makes LODSW to H, and the loading operation completes when LODSW shows L.
4	Chucking	The chucking operation completes by making ELV-M to L and feeding the elevator with the pulse signal and if the value of LPS is within a specified value.

処理内容

1	マガジン挿入	マガジンが挿入されると、MAGSWがHとなります。
2	エレベータ移動	最初にエレベータが下方に移動して、目的の引き込み位置へ移動する。
3	ローディング	ローディングモータを正転させ、トレイを引き込む。これによりLODSWがHになり、LODSWがLになった時点でローディングを終了する。
4	チャッキング	チャッキング動作は、ELV-MをLにして、エレベータをパルス送りにてLPSの値が規定値内であれば動作を終了する。

Exploded View (CD Mechanism) ● DT24A010


(A) MOLYKOTE "E" PASTE (11S42419J09)
(B) GREASE PG-671 (11S42419J14)
(C) GREASE SILICONE (11S490487)
..... Tightening Torque
..... Point of GREASE applied.

CD Mechanism Assembly Parts List

Note : No parts number on parts list are not supplied.

Symbol No.	Index	Part No.	Description
6		41B51993W01	Spring, Extension
7		47A51917W01	Shaft, Guide
8		03S94385F09	Screw, Pan (M2×3)
9		03S94385F19	Screw, Pan (M2×2.5)
10		04B41345P22	Washer, Lock (M2.6)
11	2-F	44B51886W01	Rack, Elevator
12	2-F	03S40014G07	Screw, W/Washer (M2×4)
13	2-F	44A60088W01	Gear, Rack
14	3-F	44A60089W01	Gear, Wheel
15		04B41345P06	Washer, Lock (M2.1)
16	5-D	15A51889W01	Guide, Magagine
17	5-D	03S40014G66	Screw, W/Washer (M2×3.5)
18	2-B	45A51880W01	Stopper, Tray
19	2-B	41B51993W02	Spring, Extension
20	4-E	45A60160W01	Spacer, Bracket Motor
21	4-E	03S70494F12	Screw, Pan (M2×8)
22	4-F	45A51874W01	Slide, Magazine Switch
23	5-F	45A51870W01	Slide, Sensor
24	4-F	07A51882W01	Bracket, Sensor
25	5-F	03S94385F11	Screw, Pan (M2×5)
26	4-D	07A60168W01	Stopper, Shaft (B)
27	5-F	44A52035W01	Gear, Drive
28	4-F	03S94385F28	Screw, Pan (M1.7×2)
29	3-E	41A60159W01	Spring, Nut
30	4-F	41B51993W03	Spring, Extension
31	4-F	41B51993W04	Spring, Extension
32	4-F	41B51993W05	Spring, Extension
33	5-C	07A60167W01	Stopper, Shaft (A)
34	4-F	41A51996W01	Spring, Torsion
36	3-C	01B51939W01	Assy., Riv. Chassis Tray
37	3-B	01A51932W01	Assy., Riv. Bracket Push Pull
38	3-C	45A51898W01	Arm, Push Pull
39	3-C	03S40014G61	Screw, W/Washer (M2×5)
40	3-C	15A51890W01	Guide, Chassis Tray
41	3-C	07A51884W01	Bracket, Corner
42	3-C	03S94385F10	Screw, Pan (M2×4)
43	4-C	44A52036W01	Gear, Cam
44	4-C	04B41345P15	Washer, Lock (M1.2)
45	4-C	44A51896W01	Gear, Driven
46	3-B	45A51894W01	Arm, Tray
47		04B41345P02	Washer, Lock (M1.7)
48	4-B	01A51937W01	Assy., Riv. Lever Slide
49		04B41345P12	Washer, Lock (M1.7)
50	3-B	45A52034W01	Lever, Cam
51	4-B	04B41345P04	Washer, Lock (M2.6)
52	3-B	41B51993W06	Spring, Extension
53	3-C	03S94385F01	Screw, Pan (M1.7×2.3)

Symbol No.	Index	Part No.	Description
54	5-B	45A51887W01	Arm, Switch
55	5-B	15B51891W01	Guide, Tray Side
56		47A60169W01	Shaft, Pickup
57	4-A	07B51879W01	Bracket, Clamper
58	3-A	43A50683W01	Table, Clamper
59	5-C	84T65057W01	FPC Switch P.C.Board
60	4-B	41A51872W01	Spring, Clamper
61	4-B	03S94385F06	Screw, Pan (M2×1.8)
62	5-C	41A51995W01	Spring, Compression
63	5-D	41A51923W01	Spring, Rod
66	3-D	46A60171W01	Stud, Middle
67	3-E	43A60164W01	Bush, Screw (A)
68	3-E	01V61300W99	Assy., Shaft Screw
69	4-D	43A60165W01	Bush, Screw (B)
70	3-D	03S40014G62	Screw, W/Washer (M2×3)
71		03S94385F18	Screw, Pan (M2×3.5)
72	3-D	44A60162W01	Gear, Middle
73	3-D	84T65058W01	FPC Drive P.C.Board
74	4-F	44A60151W01	Worm
75	3-D	44A60161W01	Gear, Motor
76	4-E	44A11281W01	Worm

Miscellaneous

501	3-E	88T55261W01	Pick Up Unit
502	4-C	40T35543W02	Switch, Detector (UNLOAD)
503	5-C	40T35543W02	Switch, Detector (LOADING)
504	5-F	40T15222W01	Switch, Detector (MAGAZINE IN)
505	2-D	40T71025F01	Switch, Detector (LIMIT)
506	4-E	59T65085W01	Motor, 7V-370mA (LOADING)
507	4-F	59T65085W01	Motor, 7V-370mA (SLED)
508	3-D	59T65085W01	Motor, 7V-370mA (ELEVATOR)
509	4-D	59T91005F03	Motor, 2V-215mA (SPINDLE)
510	5-F	18T55678W01	Volume, Slide RS32111 10K ohm